Planning for the past:
Local temporality and the construction of denial in climate change adaptation

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Abstract

Climate change is upon us. While debates continue over how to mitigate emissions, it is evident that many parts of the world will need to adapt to an increasingly unstable climate. However, the persistence of climate denial presents a significant barrier to climate change response; if a future in which the climate has dramatically changed cannot be imagined, there is little motivation to act. Using qualitative interview data, our research investigates community responses to climate change adaptation planning in a coastal region of Australia identified as highly vulnerable to future sea level rise. While the local council engaged in extensive consultation to develop an adaptation plan, community opposition to proposed development changes ultimately resulted in a 'wait and see' response. We show how the community's local understandings of place informed temporalities that led to a practice of climate denial. We outline three processes by which climate denial is socially organised: anchoring the past via historical reference; projecting continuity through a nostalgic lens of managing disaster; and enclosing the present by prioritising existing economic value. We show how these processes result in the social organisation of climate denial, and an inability to plan for a climate changed future.

Keywords: climate change; socially organised denial; adaptation; temporality; place

1. Introduction

Climate change is apparent in the steady procession of record-breaking hurricanes, floods, droughts and firestorms that now dominate our newsfeeds. Climate scientists estimate these effects will only worsen in coming decades, with the most recent report from the Intergovernmental Panel on Climate Change (IPCC) (2018) suggesting the window to avoid dangerous climate change is rapidly closing. However, despite the mounting urgency, meaningful political action in mitigating carbon emissions has remained illusory (Spash, 2016). This is partly a result of concerted efforts by fossil fuel industries and conservative organisations engaging in concerted campaigns of disruption against national and international mitigation policies (Dunlap and McCright, 2011; Oreskes and Conway, 2010). Climate denial has been central to this strategy, which needs only to create doubt about the need for action on climate change in order to be successful. Thus while we see high levels of concern about climate change, questions about urgency, efficacy, and what is causing climate change remain (Hine et al., 2016 and Leiserowitz et al., 2011). The current policy inertia on climate change suggests that these doubts manifest as denial; further understanding of how this occurs, and the social practices which facilitate this, are crucial to overcoming this impasse.

While the climate change literature focussed on mitigation has clearly illustrated the links between vested interests and the disproportionate power of climate denial in disrupting policy (Dunlap and McCright, 2011; Oreskes and Conway, 2010), the role of socially organised denial in climate adaptation has not been so thoroughly explored. Despite a growing concern with the ability of nations and communities to adapt (Biesbroek et al., 2013; Porter et al., 2015), much of the adaptation literature remains under-theorised in terms of the social mechanisms involved (Eriksen et al., 2015). Barriers to climate adaptation are often described as isolated from each other, with limited explanation of how these barriers are socially organized and why they persist (Biesbroek et al., 2013; Brulle and Norgaard, 2019). Given that adaptation often occurs within a more localised context than mitigation, understanding the connections between how place informs responses to climate change has the potential to outline these linkages (Devine-Wright, 2013).

One key challenge is that climate change is often cast into the future – a problem not yet occurring, which requires only 'forward' thinking (Brown et al., 2012; Marshall and Connor, 2015). While some more recent research has focussed on power and politics, the temporal framing of climate change as a 'future' problem has remained (Brace and

Geoghegan, 2011). As Bierbaum et al. (2013) note, a prominent barrier to climate adaptation policies is being able to 'anticipate' what local climate change impacts looks like. For instance, as Fincher et al. (2015) show, temporal understandings of climate change are formed in the local 'present', rather than in relation to the long-term futures projected by government policy and climate science (see also Lê, 2013 and Neimanis and Walker, 2014). However, further work is needed to understand how projections of the future and conceptions of time play into processes of climate change denial (Brace and Geoghegan, 2011; Moser and Ekstrom, 2010). Our research seeks to contribute further to this discussion by developing an empirical conception of the relationship between temporality, space and denial.

Using interviews from a case study on climate adaptation in the local government area of Lake Macquarie, Australia, we explore the ways in which interpretations of time are constructed. As a region particularly vulnerable to sea-level rise, the community has been at the forefront of climate adaptation planning in Australia (Connor, 2016; McManus et al., 2014). However, our research suggests that this planning has been curtailed by a limited ability to envisage a future in which climate change fundamentally impacts coastal communities. That is, during the planning process, specific place-based orientations contribute to what Kari Norgaard (2006, p.352) terms 'socially organised denial' – the social circumstances and processes through which climate science is ignored.

We identify three processes which work together to prevent climate adaptation, each of which is based on the community's understanding of climate change within their specific place. First, we find that community members anchor their understanding of climate change through reference to past measurements, observations and experiences of the local area in which they live. Second, members project temporal continuity by emphasising the past resilience of their community in the face of previous extreme weather events. Finally, they enclose the present by prioritising immediate economic considerations, specifically around property values, while pushing back against the future impacts of climate change. We argue that these temporal orientations are enmeshed within experiences and interpretations of place. By identifying these processes, our work contributes to better understanding the social construction of climate change by placing temporality and locality at the centre of climate denial. We also add to the existing climate adaptation literature, by demonstrating how 'future' planning for climate change is, in practice, necessarily tied to place.

2. Socially organized denial

While the literature on climate mitigation has addressed denial, this is not as evident in relation to climate adaptation. In their systematic review of barriers to climate adaptation, Biesbroek et al. (2013) argue that 'the list of possible barriers is seemingly endless'. Even so, this work tends to focus on 'ecological and physical limits, economic limits, and technological limits' (Adger et al., 2009: 337; see also Meerow and Mitchell, 2017). In this context, Adger et al. (2009) argue that the importance of the social and political dimensions of how these barriers are interpreted is often minimised. As Meerow and Mitchell (2017: 2624) point out, 'adaptation is inherently political… complex, highly contextual, and uneven'. While several studies into adaptation processes note the influence of denial, this is often seen as but one factor (Eriksen et al., 2015; Hine et al., 2013; McClure and Baker, 2018). We suggest that a closer emphasis on the persistence of denial is as important to climate adaptation as it is to mitigation.

A valuable exception in outlining local processes of climate denial is the work of Kari Norgaard (2006; 2011). Norgaard's ethnography of a small rural town in Norway provides an important explanation of 'socially organised denial'. While it may be common to think about climate change denial in a literal sense – 'it's not happening' – it is also useful to observe other ways in which denial is manifest. That is, individuals might not stipulate an outright objection to the science of climate change, but deflect its urgency, or question the efficacy of taking action; responses which, in practice, lead to the denial of climate change by ignoring it. Norgaard (2006; 2011) argues that these dynamics are socially produced through everyday practices in ways that limit participants' responses to climate change and result in the social construction of denial. In this way, community members make decisions about climate change and whether it is risky to them within the everyday practices of their lives (Douglas and Wildavsky 1983). It is important to note that individuals may not articulate an opposition to climate science itself – rather, denial is manifest in a lack of action and the shifting of attention, which is justified by reference to issues outside of the frame of climate science.

These explanations are useful in understanding how communities engage with the threat of climate change. However, these frameworks are lacking in their development of a temporal dimension in understanding climate change denial. While Norgaard (2011: 128) touches on the notion that uncertainty about the future can be a motivator for ignoring the impacts of climate change, we investigate the ways in which temporality affects this. In doing

so, we suggest that temporality is a crucial aspect of how climate change science is interpreted and is intimately bound to individuals' sense of place.

3. Temporality in local adaptation

While there is a burgeoning literature on climate change and temporality (see for example Brace and Geoghegan, 2011; Neimanis and Walker, 2014; Slawinski and Bansal, 2012), detailed discussions of the ways in which interpretations of time have impacted adaptation processes are limited (for notable exceptions, see Fincher et al., 2014 and 2015). For the most part climate adaptation is presented as a linear process, a logical, politically neutral response to risk which requires 'rational' forward thinking and planning (Moser and Ekstrom, 2010; Smit and Pilifosova, 2001). In particular, policy literature on adaptation has focussed on 'long' and 'short' term solutions, seen as a linear progression (Lim et al., 2005). While some more recent research has focussed on power and politics, the temporal framing of climate change as a 'future' problem has remained (Brace and Geoghegan, 2011). As Bierbaum et al. (2013) note, a prominent barrier to climate adaptation policies is being able to 'anticipate' what future climate change impacts look like at the local level.

In terms of conceptualising time, these reflections fit within the broader framework of 'clock time' – that is, 'linear, measurable, divisible, precise, deterministic, and subject to only one interpretation' (Slawinski and Bansal, 2012: 1540). By contrast, 'event time' offers a more subjective, experiential view of how we interpret the past and envision the future. For instance, Kockelman and Bernstein (2012: 325) discuss what they call 'temporality as reckoning' whereby particular events are used to mark a 'privileged point of orientation' around which other events are ordered. For example, in their work on residents' anticipation of sea-level rise, Fincher et al. (2014) reveal how 'time stories' orient participants' values towards continuity in time and place that are not commensurate with the ways in which adaptation policy was presented. Such examples show how actors reckon with time by orienting present events towards the past and the future in mobilizing – or immobilizing – action (Nyberg et al., 2018).

The connection between the present and the future is widely discussed in the climate change literature, from questions about 'discounting the future' (Weisbach and Sunstein, 2009), to appeals for intergenerational equity (White, 2017). Yet these more abstract notions of time can be contrasted with research showing that people's everyday experiences of

weather often impact on concerns about climate change (Connor, 2016; Hamilton and Stampone, 2013). That is, it is not only experiences in the present which influence the potential for seeing the future, but particular experiences in particular places.

4. Understanding climate change in place

As Brace and Geoghegan (2011) note, recognising the role of place has the potential to provide a 'grounded and localised' understanding of the ways in which climate change is understood in practice. For instance, particular places hold with them a sense of both history – the past – and understandings of the present, which shape the ways in which we envisage the future (Lowenthal, 1975). Research indicates that sense of place for property owners can influence both emotional and policy-related attitudes (Jorgensen and Stedman 2001), and further, that this can result in delaying climate adaptation to flooding (Harries and Penning-Rowsell, 2011). Precisely how this relates to climate change is yet to be fully explored, although some studies, drawing on the work of Elizabeth Grosz (1998, 2005), have suggested there is value in relating future temporalities to the individual body (Neimanis and Walker, 2014) and localised places (Brace and Geoghegan, 2011; Fincher et al., 2014 and 2015).

Elaborating on these views, we propose that place is of central importance to experiences of time. If temporality has its origin in an 'event', then this event happens in a place (Malpas, 2017). The event, or time reckoning, is already placed, with particular temporal constructions and understandings bound to local and everyday practices. Through these experiences, we make sense of events as situated in time and space – what both Schatzki (2010) and Malpas (2012), engaging with Heidegger (1962, 2003), refer to as 'timespace' – the act of being in the world is experienced temporally and situated in place.

With this situated emphasis to understand experiences, we refer to 'place' to specifically discuss the ways in which connections to physical location are 'bounded' by familiarity and a sense of belonging, while 'space' refers to the abstracted notion of this potential or 'extendedness' (Malpas, 2012). Since the future can only be understood through the present and the past (Nyberg et al., 2018), these experiences in place are central to the possibilities for envisaging climate change. The importance of place has been recognized, with recent studies suggesting that localised attachments to place are more likely to result in resistance to change (Devine-Wright et al., 2015; Fincher et al., 2015; Harries and Penning-Rowsell, 2011). This is partly because of the contrast between experiences of place and more

abstract understandings of climate change which come from science and government policy (Fincher et al., 2014; Fincher et. al., 2015).

The connection between temporality and place is the action of relating our experiences to our existence (in time) and involvement (in place). The temporal meaning of being provides humans with direction – a projection towards the future (Heidegger, 1962) – that is always already placed. Our involvement in place or 'lived time' thus provides us with both subjective experiences of time and reified (objective) time. The experience of the world is then based on an *a priori* understanding of the world from a place, which shapes how we make sense of what is presented to us both temporally and spatially. As is documented by Fincher et al. (2014 and 2015), when something like climate change is presented to communities, it is from their local experiences that the information is understood. In what follows, we elaborate on how these dynamics lead to a social organisation of climate change denial.

5. Methods

5.1 Case study context

Our research is based on a qualitative case study of climate change adaptation in the Lake Macquarie region of New South Wales, Australia. The region was chosen as part of a broader project investigating 'climate hotspots' – regions where the impacts of climate change are resulting in political contestation over how to adapt. Lake Macquarie is a local government area surrounding one of the largest salt water lakes in the southern hemisphere (see Figure 1). The area is already subject to regular flooding, and as climate change accelerates, the combination of sea-level rise, increased storm events and high rainfall are predicted to exacerbate this issue. In 2008, Lake Macquarie City Council released their Sea Level Rise Preparedness Adaptation Policy which included recommendations for stricter development controls which would require new residential and commercial buildings to be built up to 2.85 metres above ground in the most vulnerable areas. These provisions were based on IPCC projections of future global sea-level rise as well as national scientific estimates of regional variations. The council's policy was supported by research from the Federal Department of Climate Change (2009) which identified Lake Macquarie as one of six local government areas in Australia most vulnerable to sea level rise.

In the following years, ongoing media attention was given to the issue, with the local newspaper, the *Newcastle Herald*, emphasising community concerns about the impacts the policy would have on insurance, property values and building costs. In response to the council's development controls, a prominent property developer in the region threatened to sue the Council (Goffet, 2012), and organised a public meeting at which well-known climate change deniers spoke. Within this context, the council undertook a program of extensive community consultation using 'an innovative collaborative approach' (Stevens et al., 2012), on an area by area basis, based on vulnerability to the predicted impacts of climate change. The council engaged an outside agency to facilitate the implementation of a collaborative governance model, first training staff in the model and then moving on to work with stakeholders in co-defining the dilemma and, eventually, producing an adaptation plan. The program began with a pilot area covering two suburbs. The consultation process for this area lasted three years and was widely interpreted as a success (Stewart, 2017). However, the council's proposals for stricter development controls ultimately failed to be implemented. Indeed, in response to the vigorous opposition of the community, the council reverted to a 'wait and see' approach based on potential 'trigger points' of rising lake levels. This meant that no material adaptation will occur until aspects of sea level rise are locally observed in the 'here and now'.

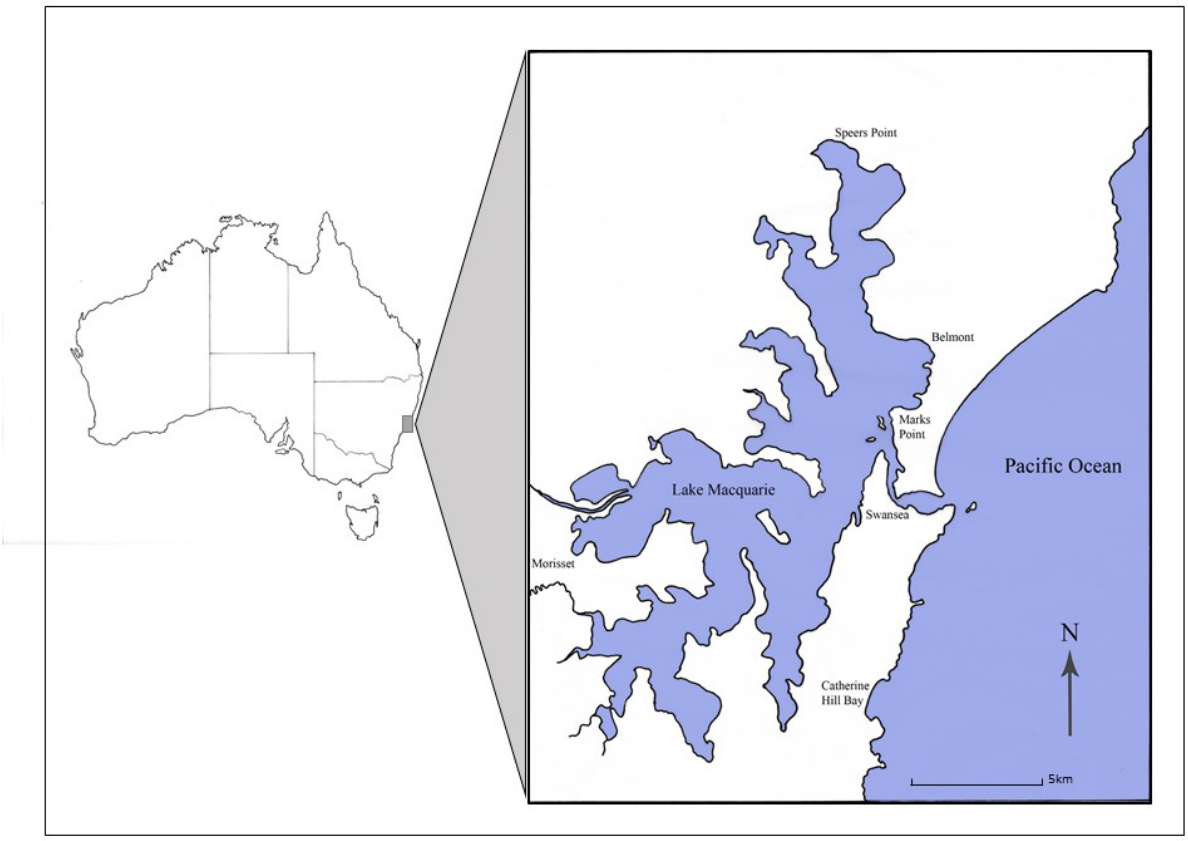

Fig 1. Map of Lake Macquarie on eastern Australian coast

5.2 Data collection

The study makes use of 46 interviews with stakeholders and experts in the planning process carried out between December 2017 and December 2018. Participant selection was purposive, with participants sought from key stakeholder groups as identified through analysis of media and council documents. These included individuals involved in the policy development and adaptation planning process, such as residents in local community groups, council (and former) employees and politicians, state government (and former) employees, and consultants to council, as well as business leaders, and journalists who covered the issue (see Table 1).

Table 1. Interview respondents

	Description	Pseudonym
Business		
1	Director, Sustainable development	Jane
2	Chair, Property development	Phil
3	CEO, Urban planning development	Mark
4	CEO, Property valuation	John
5	Director, Engineering consultant	Steve
6	Director, Planning consultant	Scott
7	Specialist, Insurance	James
8	Resilience specialist, Property development	Matthew
9	Environment specialist, Consultancy	Andrew
10	Director, Real estate	Julia
11	Engineer, Engineering firm	Aaron
NSW government		
12	Scientific specialist	Jacob
13	Environmental impact specialist	Edward
14	Environmental engineer	Jasmine
Consultants/ experts		
15	Community consultant	Jackson
16	Academic, environmental science	William
17	Academic, social science	Anthony
Council - politicians		
18	Independent	Nick
19	Labor	Joseph
20	Liberal	Tyler
21	Labor	Jonathan
22	Labor	Andrea
23	Greens	Amanda
24	Labor	Noah
Council - employees		
25	Management	Emily
26	Environmental security	Thomas
27	Sustainability officer	Cameron
28	Landuse planner	Emma
29	Sustainability officer	Gavin
30	Landuse planner	Eric
31	Environmental security	Luke
32	Sustainability and planning	Olivia
33	Management	Owen
34	Management	Adam
Community		
35	Vice president, community organisation	Sean
36	Resident, community organisation	Sarah
37	Resident, community organisation	Christian
38	Resident, community organisation	Elizabeth
39	Community organisation	Kyle
40	Resident, community organisation	Abigail
41	Environment group	Aidan
42	Regional community organisation	Adrian
43	Community organisation - energy	Carlos
44	Community organisation - energy	Nathan
Media		
45	Journalist	Bryan
46	Journalist	Oliver

Ethics approval for the research was granted by the Human Research Ethics Committee of the University of Sydney (Approval Number 2017/70). The interviews were semi-structured (see Appendix 1) and covered topics including: participant's involvement with the planning process; perceptions of and interactions with other stakeholders; concerns about responding to climate change and understandings of sea-level rise. Each interview lasted between 45 and 90 minutes and all interviews were recorded and fully transcribed. The interview transcripts were then imported and coded using thematic analysis in the qualitative data analysis software *QSR NVivo*.

5.3 Analysis

Analysis was guided by Strauss and Corbin's (1990) approach to grounded theory, with the intention of understanding the processes involved in the development of climate adaptation planning. Coding began in the early stages of data collection, with an initial open coding of interviews. Coding was focussed on key themes – or higher-level concepts – such as 'climate change', 'community consultation', 'governance' and 'costs'. During this process, lower-level concepts were also developed – for instance, under 'climate change', participant comments were coded for 'acceptance', 'denial', and 'certainty'. Towards the end of interview completion, previously coded interview transcripts were reviewed and recoded to reflect any changes to the coding system which had developed over time.

Following this process, we used axial coding as a means of interpreting the ways in which participant positions related to each other and practices within the debates over adaptation (Charmaz 2006). This process was guided by the questions: 'what practice are participants describing?' and 'what were the outcomes of this practice?'. It was at this stage that we saw the themes of temporality and place as central to participant responses. We then identified three key processes that underpinned community members' responses to the council's adaptation initiatives and climate science more broadly. These are detailed in the findings that follow and in Appendix 2.

6. Findings

Our analysis highlights three processes which explain how the denial of climate change is socially produced: *anchoring the past* – a focus on what has been observed in the past within local conditions, at the expense of planning using climate science; *projecting continuity* – an

emphasis on local historical experiences of resilience in order to suggest that the future will not be affected by climate change; and *enclosing the present* – the prioritisation of individual property rights at the expense of collective action. While literal denial of climate change was a less common theme within interviews, these processes, we argue, recast climate change as an abstract concept which may or may not happen in the distant future. In this way, the processes function together to create a socially produced climate denial.

6.1 Anchoring the past

Respondents expressed a strong sense of place throughout their discussion of the policy development process and in relation to their understanding of climate change. By emphasising the local, specifically the lake around which the area is located, participants provided alternative explanations of the threat of climate change. Local knowledge, gained through measurement, observation and experience, displaced climate science as a guiding tool for planning for change. Through this process, participants anchored their knowledge in the spatial past, closing off concern for climate change and suggesting that the modelling was an abstracted theory which was unlikely to occur.

For instance, participants emphasised local knowledge about the lake, arguing that it had not been observed rising in line with the IPCC predictions, and that concerns about increasing flooding were exaggerated. Respondents suggested that historical measurements showed minimal sea level rise, and therefore the local council must be using the wrong data. This was put forward as an argument against climate science, which was presented as only a 'theory':

> 'The theory that Lake Macquarie Council staff were working on was not only that it going to rise by 800 millimetres, but it is accelerating. The facts are by measurement, not theoretical rubbish, by measurement, that it's not accelerating at all. In fact, it is decelerating' (Phil, property developer)

This idea of 'theoretical rubbish' was salient in other comments about the planning process, where individuals argued that climate modelling was not as accurate as using previous measurements of the lake. As one participant (Kyle, community organisation member) commented, 'the only accurate information is to go back 100 years'. Thus participants argued that localised and historical measurements should guide future policy direction.

Past observations of the lake were also invoked to argue that to take action, there should be existing conditions which proved climate change was occurring, and that these were not being observed. For instance, as one interviewee argued:

> ‘Think about it, if you have a house down at Belmont on the lake, you're not going to be out there every day with your ruler, trying to figure out whether the lake is actually getting any higher. If you've lived out there for 40 odd years you probably would say, “I don't think it's changed”. If you look at a map that predicts in 40 years’ time that the water is going to be coming into your house you're going to go, “that's rubbish”. I think people are right to be sceptical about the impact of climate change. Like most of us, you don't believe it until you see it.’ (Bryan, journalist)

Residents thus stressed the uncertainty of scientific projections, with the risks of planning around science-based models seen as more significant than relying on established experience.

Members of the community shared these historical observations and spatial measurements, enacting a collective local experience of information about the natural environment – a kind of oral history which showed a sense of care for the place that had been built up over time. These experiences were passed on between generations and others in community:

> ‘you've got the elderly saying, “but I've lived here with my grandfather, when I was a kid, and he's in his 90s, I marked where the water was and when we used to come out fishing and that hasn't changed”. So, you've got that response. What sea level rise?’ (Sarah, community organisation member)

The experiences which were shared within families – of spatial marking of water levels and making use of the lake for recreational activities – were also passed on through the community and brought about a sense of continuity. According to these residents – and some councillors and business leaders - the lake was not observed as changing throughout this shared local history, therefore, it was argued, there was no need to worry.

These statements brought into question the potential impacts of sea level rise on the area, suggesting that the predictions that the council had been using were unfounded. These counterclaims provided a place-based explanation for what was happening by re-orienting discussion towards the need for data which showed what had been observed rather than what might happen in the future. These observations, experiences and measurements worked not

only to emphasise local knowledge of the Lake Macquarie area, but also to anchor knowledge to the past, which suggested that there was no means of incorporating future climate change, or any other impacts into what people thought was happening within Lake Macquarie. As Sarah (community organisation member) summarized: 'The future; how can you apply the future to what we see?' – if there are no changes being observed, or passed through the community over time, there is nothing on which to base policy.

6.2 Projecting continuity

Just as anchoring the past oriented participants away from concern about climate change, these discussions also informed a view of the future whereby current practices would remain unchanged. The ways in which participants discussed previous local experiences of disaster and flooding, for instance, suggested that these were easily manageable. These perspectives provided a specific temporalizing viewpoint, which reinforced the assumed resilience of the community against the future consequences of climate change. In doing so, participants suggested that little would change – that humans would manage disaster as they always had; a process we term 'projecting continuity'.

A prominent way in which continuity was projected by participants could be seen in the discussion of local flooding events as normal. Proximity to the water, combined with a storm water system that drains into the area's central lake, meant that the region regularly experienced flooding – the most recent of which occurred in 2007 and 2015. These experiences meant that for many residents responding to flooding was routinized. As one participant argued, the inconvenience of flooding was manageable:

> 'I've been here when it's flooded. Is it scary? Put my galoshes on, the water's backed up the sewer [pointing to her bathroom]… I go down the pub for a pee or Macca's [McDonalds]. … It's a time thing.' (Sarah, community organisation member)

Sarah's comments here directly contradicted the common depiction of flooding as 'scary' – in contrast, she emphasised the local experience as a reason to find sanctuary in public centres usually used for relaxing and socialising (such as the local pub or McDonalds). Her comments suggested that in her experience flooding was just a minor inconvenience, rather than a serious disruption to residents' lifestyles or properties, and not necessarily a cause for

concern. In this way, respondents suggested that flooding was a normal part of existence – a compromise, perhaps, for living in a beautiful place – and not something about which they were especially concerned.

In a similar way, recollections of the ways in which humans have responded to other disasters were employed to argue that local responses to future problems were manageable. A comparison was made with experiences of bushfires to argue that the community was resilient and would be able to 'defend' their properties:

> '…in the same way that we will defend our homes against bushfire, we will defend our homes against sea level rise. That notion of defending your home was - the analogy with fighting a bushfire - was so powerful an analogy for me that I now use that wherever I go and talk about it because it's something that people can see instantly - how you respond to something. It's not a case of throwing up your hands and saying "whatever".' (Joseph, politician)

However, this analogy neglected to recognise that lives are lost and properties regularly destroyed by bushfires in Australia, with each experience commonly followed by public debate about whether people should indeed, stay to defend their home. In this way, participants' historical recollections emphasised their connection to place as something which, having been defended in the past, was immutable. Central to this was a nostalgic representation of humanity in place – the emphasis on people's homes as being a bond to a place which must be defended.

The general acceptance that because there has always been flooding, there always will be, contradicted concerns raised in relation to climate change impacts, which would require major changes – and possibly even retreat. It is perhaps no surprise then that within this context, it was suggested that there was no need to change previous practices, and that adaptation, if needed, would be easy:

> 'I think the community will adapt to sea level rise. Adapting to sea level rise - the plan is simple - raise the houses, defend the borders. Every hundred years - this place, as I said, it's only 2007 but in 100 years' time, it will be looking for a knock down. When you knock it down, you match the sea level rise and that lasts another 100 years.' (Sean, community organisation member)

In contrast to the notion of a threatening or uncertain future posed by climate change, recollections of, and analogies to, previous 'natural' threats and the idea of ongoing progress

suggested that the community would overcome any potential changes. Such suggestions 'delink' the science of climate change to that of what is considered normal, manageable changes in the natural environment. In practice, this was used to argue that existing ways of managing risk would be sufficient to deal with any future concerns; specific climate adaptation measures outside of these practices were then seen as unnecessary.

These responses thus emphasised a shared history among the community – a sense of continuity, rather than change. As one participant noted, 'We've always had flooding, we're going to flood every 10 years - we won't get another one for another 10 years.' (Edward, former state government employee). Through projecting a linear continuity, the community not only referred to historical observations of place, or experiences of previous disasters, but actively built on a past sense of community. This had the effect of closing off alternative future views of the region. These discussions thus reinforced notions of place, which could only be understood through a particular frame of shared, historical experience projecting a non-threatening future.

6.3 Enclosing the present

A final means by which climate change was denied in the adaptation process was through enclosing the present. This was evident in the emphasis upon the spatial division of private property and the intense debates that occurred around defending those properties, with individuals arguing that the council was overstepping their role and that home owners should be able to decide how to manage the threats of flooding in their homes. In doing so, interviewees emphasised losses they felt they could absorb in the present, and in this way disrupted the argument that climate adaptation was a necessity. That is, the power and economic structures of the present – in which the individual right to property is central – was asserted as a means of closing off a future in which climate change meant that these values were subsumed.

A primary source of anger and concern in the community came from anxiety that land values were declining and insurance premiums were increasing as a result of properties being spatially classified as flood prone. A prominent story in interviews related to a number of angry public meetings during which these issues were raised.

> 'The anger was - I think it came from that people had this flood zone, which meant that their property value was undermined. Some people were

> experiencing increases in their insurance premiums, so it was costing them more, and there was a perception that it was affecting their property values, stuff like that. I think they felt like we were doing something to them, like giving them a flood zone that they didn't have until we came up with it.' (Olivia, council)

These observations were echoed in discussions with residents:

> 'They overnight put in flood signs. People that weren't in a flood zone overnight came into a flood zone. Prices of houses fell. You couldn't sell a house, so residents of Marks Point were pretty upset.' (Sean, community organisation member)

In this sense, the very act of alerting people to the potential impacts of sea level rise on properties was seen as impacting their value. It was, as Olivia noted, the actions of council which were seen as the biggest threat. The consultation process was framed by concerns from residents that the spatial zoning itself had impacted on the value of their properties. Added to this, an increase in council rates at the time, created a situation where the council were seen as exploiting their power:

> 'At the same time all this stuff was going on, this council put up rates by the highest of any council in the state's history. You know the rates were continually going up to fund these sorts of things. Meanwhile things like roads and other infrastructure that needs improving wasn't improved…to me it was just way out of proportion to what their actual role is, and what their expertise was as well.' (Oliver, journalist)

These arguments were often associated with the idea that council staff were not qualified to make decisions about flood zoning, and that the council was overly bureaucratic. Critics argued that resources were not being properly used and that council were interfering to an extent 'way out of proportion to what their actual role is' – that is, that they were unnecessarily intervening in individuals' rights at the same time as being irresponsible with their own finances. As a result, the consultation process was framed by the economic circumstances of individuals within the community and on conserving existing relations of power and property.

The centrality of property prices to the community consultation process highlighted an emphasis on the present. This immediate issue of property prices was of concern to

residents, who argued they were experiencing these impacts already, as well as the council, which was receiving a lot of negative publicity and pushback from the community. While there was some difference in participants' views on whether property values were being affected, the emphasis on present value was clear.

In response, the council brought in insurers to discuss with residents the implications of the planning process, insisting that it was not having an impact on property prices and costs. While some participants were still wary of the issue, this appears to have had some success and the process was able to move forward. However, council representatives acknowledged the growing controversy and how this affected their approach to community consultation:

> 'We were under attack by - some of them were what I'd call clearly vested interests … people who were holding land around places like Belmont South and Marks Point. All of a sudden, they were having to raise their land a metre or something like that to build a house. Sadly, my view is that we actually overstepped the mark.' (Nick, politician)

Present concerns – for both the council and the community – clearly influenced the boundaries which shaped community consultation. As noted by Nick above, and the local newspaper at the time, the consultation process brought about a shift in focus and the new adaptation plan emphasised the efforts to protect properties from sea-level rise. In addition, the revised adaptation plan focussed on what participants called 'trigger points' – that is, that no actions were required until specific, physical impacts of climate change, as indicated by sea-level rise, were experienced. Finally, the climate adaptation plan ultimately lacked funding. The collective response, then, became more about appeasing tension in the community over present property values than planning for the future impacts of climate change.

7. Discussion

Our research findings suggest a number of challenges in managing climate adaptation which are indicative of the broader responses to the problem of climate change itself. The processes observed in this case illustrate the interactions between temporality and place constructed through community engagement with climate science. The community reckoned with time in climate change through anchoring the past, projecting future continuity and enclosing the

present. These processes provide an explanation of how place informs local constructions of time and work together in a dynamic which results in delaying climate adaptation; constituting a socially produced denial of climate change. These processes of temporality extend the current literature on the social practices of denial by emphasising the importance of understanding the interactions between temporality and place.

7.1 The difficulty of spatial divisions

Given the context of the interviews, it is perhaps not surprising that participants would focus on the local as a means of discussing their views. This situation, however, highlights the difficulty of incorporating an understanding of global climate systems within local contexts. If communities, business and governments are engaging at this level and attempting to take leadership – whether it is on climate adaptation or mitigation – sense of place will inevitably have an influence on people's understanding of the issues. To the extent then, that it is seen as coming from 'outside', the potential impacts of climate change are denied, and expertise is seen as uninformed. The ways in which the community reckons with time through place provides a means of prioritising particular forms of knowledge – local and historical – and closing off climate science and issues such as sea-level rise as theoretical, untrusted and unobservable claims.

A further closing off occurred through the emphasis on property values and insurance costs – this may have been a successful political strategy in terms of appeasing residents, however, it can also be seen to reinforce notions of individual capacities for resilience and the division of space into separate (privately owned) properties. This focus on measured and divided space resulted in a postponement of any significant adaptation action, in that community members, drawing on their particular experiences, could argue that an immediate response to sea-level rise was unnecessary. In this way, the spatial division reinforced notions of resilience and the dominant discourse of the rights of individual property owners over concerns about adaptation to climate change.

7.2 The intangibility of climate change

Moreover, the spatial experience of not being able to touch, feel or see changes that are occurring in the planet's climate system becomes a means of explaining climate science away as theoretical – or 'just a model'. In contrast, local experiences and practices are readily

available to account for the spatial dimension (e.g. centimetres of sea-level rise) and temporal orientations (e.g. the lake as immutable). The practices of living *in place* were central to interpretations of climate change and this familiarity resulted in the construction of boundaries, rather than opening up to other possible articulations of timespace (Malpas, 2012). Thus, the time reckonings in climate science projecting sea-level rise in particular areas might be made 'intelligible' to the community, but this does not necessarily mean that they will be experienced as locally useful.

Further, participants' sense of place, relationships with the community, and experiences of previous flooding works to create a sense of nostalgia. As Lowenthal (1975) has noted, it is not uncommon for a sense of place to guide nostalgic notions of stability, durability and resilience. Nostalgia here is an expression of returning to place, perhaps a homecoming, of belonging. Considering our position on temporality, this is not backward looking, rather it is a future direction towards places and practices that appear familiar and available. Through this process, however, the creation of the (future) past displaces climate change – it becomes a theoretical event. So rather than planning for a future in which sea level rise is envisaged as causing disruption, there is an emphasis on the impacts of climate change as manageable. While situated in place, both temporal and spatial constructs are relative and contextual. The local understanding is used as a 'yardstick' and science is seen as falling short.

7.3 A 'wait and see' approach

The emphasis on experiences of place thus works to remove the community from the broader impacts of climate change. Information is localised and understood through indicators of future trigger points, which recasts climate change as something which does not have to be dealt with until it is seen. In many ways our work observes a similar phenomenon to Fincher et al. (2015) who argue that 'popular messages of permanent, climate-driven catastrophe are incommensurable with local time-spaces'. Because of this, it is argued that 'waiting and acting in short steps, each step being triggered by a change in environmental (or social) conditions' (Fincher et al., 2015, p. 271) is the best response to developing climate policy. That is, that environmental changes will be recognised once they have an impact on the local community (see also Barnett et al., 2014). This is, indeed, the pathway adopted in our case study in order to achieve consensus. However, our case study also highlights elements of the

ways in which these processes come together to produce a socially organised denial, which delays responding to climate change. By insisting that the indicators need to be seen (or felt), the community attempts to close itself off from the planetary system; indeed, even discussions about the lake were made to seem separate from sea-level rise. This results in place being temporalized as historical – there is no means of envisaging that it can change – and politically, seen as owned and best understood by the community.

In these ways, notions of a 'sense of place' – which are often thought of as commensurate with a care for the natural environment – are increasingly used as means of delaying change. In a similar way that Devine-Wright et al. (2015) find strong national – as opposed to global – attachments are less likely to support action on climate change, we find that connections to the local can also disrupt willingness to change. Following Devine-Wright (2013), the issue then appears to be how to transfer the global issues into local, place-based concerns. Our case study suggests that in addition to an emphasis on local time stories (Fincher et al. 2014), it might also be necessary to find a means of linking these time stories to the global and, more urgent, understandings of environmental change.

7.4 Changing temporalities

With the sense of place mainly being temporalized as historical, there is no means of envisioning change. This is evident in how the participant interpretations of time do not allow for what we might call a 'climate change future'; that is, the kind of future being predicted by climate science. As our analysis shows, participants mobilise a very particular temporality by incorporating nostalgic knowledge of the region and responses to disaster, which reinforces a historical, imagined future in which sea level rise is minimal, if it occurs at all. As Nyberg et al. (2018) have argued, these temporal means of understanding time in relation to climate change move beyond the traditional views of 'clock' time. What is interesting is that climate change is framed in terms of 'clock' time – but forever in the future, until it becomes an 'event'. In this way, temporality works to reconstruct historical experiences through the local planning process in order to disrupt the notion that climate change will necessitate major social, political and economic adjustments.

Following Norgaard (2011), in this paper we have gone beyond categorizations of denial – literal, interpretive and implicatory – to further show how denial is a social process through which meaning making and reaching consensus are contained by temporal

interpretations and priorities, understood from a particular place. These processes do not, individually, constitute an outright denial that climate change is happening; rather, they function together to produce a socially constructed rejection of the ability to manage climate change. The dynamics of rejecting climate science occur through prioritising localised forms of knowledge, which are anchored in the past and project a continuity where past practices manage future events. At the same time, the need to maintain economic (property) values works to delay the need for a shared response to climate change. That is, it becomes impossible to act on climate change because the science is not believed, the future cannot be seen, and there is a vested economic interest in resisting adaptation measures.

8. Conclusion

Our research highlights the interactions of three local processes which, we argue, ultimately supports the need for understanding the social organisation of climate denial in terms of temporality. This necessarily includes an understanding of conceptions of place and the construction of temporality in which we are attempting to make sense of climate change. The conceptualization of 'timespace' assists in showing how climate change adaptation plans are experienced locally. Both the temporal and spatial aspects are understood in relation to place; climate change adaptations are bounded by shared temporal and spatial experiences that show up in measurements (e.g. years, decades, centimetres, regions) and orientations (e.g. past, future, inside, outside) of time and space. In this case study, we have highlighted the ways in which this process produces a denial of climate change which is embedded in daily practices.

Of course, resistance and denial of the 'inconvenient truth' of climate science is an ongoing feature of climate politics more generally, where the need to assuage community concerns and maintain political stability often result in a failure to implement tangible action. This broader process of politically orchestrated denial of climate science is evident in Australia in the rejection of a legislated price on carbon emissions and political support for renewed fossil fuel expansion (Eckersley, 2013). It is also evident in the slow and chequered process of international climate negotiations and the movement of national governments in and out of that process in response to domestic political interests. These movements emphasise the tensions between localised understandings of environmental change as they relate to time, and the globalised complexity and uncertainties inherent in climate change as a phenomenon.

Indeed, by reckoning with climate science through the processes we describe, the community projects a future in which sea level rise may or may not be a problem. In many ways this makes sense as a means of avoiding the uncertainties of the future, which can evoke unease, if not fear, particularly when discussing potentially catastrophic changes. This is precisely the dynamic about which Beck (2009) speaks – that because climate change is an intangible risk, it needs to be 'staged' – the 'invisible' made 'visible' through socially recognised examples of disaster. However, our research suggests that the ways in which particular events – experiences of flooding, or bushfires – are evoked as a form of temporal reckoning, leads to denial of climate science and a 'wait and see' approach. The past is interpreted, and pulled into the present, as a means of envisioning a future without climate change. In this way, the future itself is denied. That is, it does not exist until it is in the present, which logically suggests that the future never happens.

The question remains as to how climate change might ever be seen as 'present'. Our research suggests that even in the event of climate related disasters, participants may strengthen their commitment to responses aimed at protecting properties rather than changing practices around planning. Yet if, as we have emphasised here, temporality is intricately linked with place, this resistance can only last while place is reproduced. That is, climate change itself may ultimately function to 'open up' place-bound experiences of temporality to envisage a different future.

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