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Valuing Nature for Wellbeing: Narratives of socio-ecological change in dynamic intertidal landscapes

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ABSTRACT

Contributing to the cultural ecosystem services literature, this paper draws on the in-depth place narratives of two coastal case-study sites in Wales (UK) to explore how people experience and understand landscape change in relation to their sense of place, and what this means for their wellbeing. Our place narratives reveal that participants understand coastal/intertidal landscapes as complex socio-ecological systems filled with competing legitimate claims that are difficult to manage. Such insights suggest that a focus on *diachronic integrity* (Holland & O'Neill, 1996) within place narratives might offer a route to more socially and culturally acceptable environmental management strategies.

KEY WORDS: Cultural ecosystem services; Relational; Cultural values; Wellbeing; Coast; Landscape Change

INTRODUCTION

As the products of continuous interactions between biophysical and social worlds over millennia, landscapes are always changing. This is perhaps most perceptible at the coast, where tidal landscapes and their liminal intertidal zones repeatedly empty and fill, providing a highly visible temporality from hour to hour, unlike other natural cycles, which are usually imperceptible on a daily basis (Jones, 2010; 197). As noted by Jones (2010), within these zones, the tide – whether high or low, rising or falling – can become a marker of the lived flow of time, informing the interactions and experiences of local people with their surrounding environment.

Recognised for their symbolic and therapeutic qualities, as well as a range of other benefits, intertidal zones face increasing pressures from climate change, sea-level rise and human development (Thomas et al., *Under Submission*). Forecast to significantly affect the extent and distribution of vulnerable intertidal habitats, such as coastal wetlands, landscape change brought about by these processes will not only change the appearance of already dynamic coastlines, but alter ecosystem functioning and stability as well; likely impacting local people's sense of place and wellbeing in numerous ways (Arias-Arévalo et al., 2017).

Responding to environmental change - whether anticipated (or not), natural, or human-induced - is by no means a straightforward process, not least because making decisions about the future of cultural landscapes is fraught with tensions regarding the most appropriate way of moving forward (Henwood & Pidgeon, 2011; O'Neill et al., 2008). Decision-makers, for example, prioritise protecting people and properties, taking less consideration of how landscape change brought about by management decisions might impact the affective qualities of places, including the attachments to and meanings associated with them (commonly called cultural, 'non-material' or 'intangible' values/benefits within resource management circles), and why such changes matter for human wellbeing. While the

processes of integrating such concerns into decision-making are often claimed to be difficult and contentious, failing to do so can create critical social impacts, such as feelings of loss and exclusion, that can ultimately lead to the breakdown of well-intentioned management schemes (Gould et al., 2015; Stedman, 2003).

When considering the cultural dimension of ecosystem contributions to human wellbeing, it is often claimed that cultural ecosystem services (CES) are challenging to assess using the methodologies (i.e. quantitative) and valuation techniques (i.e. economic) usually associated with ecosystem service-based approaches (Chan et al., 2012). Commonly described as '*intangible*' benefits that people obtain from ecosystems[1] within the ecosystem services literature, critics argue that CES require more appropriate assessments rooted in approaches that highlight culture's interpretative and provisional qualities (Chan et al., 2012; Fish et al., 2016a).

Responding to these claims, a small but growing body of CES scholarship draws on qualitative, participatory and situated approaches - commonly used in place-based research within the humanities and social sciences - that pay heed to the thoughts, feelings, perspectives and experiences of local communities to better understand the cultural values/benefits at stake when it comes to environmental management (Chan et al., 2016; Fish et al., 2016a; 2016b; Gould et al., 2015; Klain et al., 2017; Pascual et al., 2017; Plieninger et al., 2013; Poe et al., 2016). Such approaches are best described as *relational*, allowing for human meaning and experience to be explored in the context of situated material processes and entities (Fish et al., 2016b; 209; 2016a; Schaich et al., 2010; Stenseke, 2018), where CES are recognised as the co-produced outcome of people's interactions with places, localities and landscapes (Chan et al., 2011), and where wellbeing is an emergent quality of emplaced

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[1] Through '*spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences*' (MEA, 2005; 4).

processes and interactions; inherently dynamic and subject to change over time (Atkinson, 2013).

A relational approach to people-place interactions produces a more holistic understanding of cultural texts, practices and/or artefacts as being shaped by their material contexts, which in turn shape how people identify and express themselves (Ryfield et al., 2019; 2*)*. Nowhere is this more evident than in the embodied, situated experiences – the sights, sounds, smells, haptics, feelings, thoughts, stories and concepts – that make up a 'sense of place' (Van Noy, 2003 – cited in Ryfield et al., 2019), where people are said to express stronger feelings of care and concern for local environments as well as an increased sense of wellbeing (Poe et al., 2016).

As noted by Ryden (1993), a sense of place is most clearly articulated through narrative expression, which gives meaning and coherence to people's lives and to the environments within which those lives are lived (O'Neill et al., 2008). Focusing on place narratives foreground why environments matter, as they embody the context in which human activities take place and through which we understand their value (p.198). Human stories not only embed themselves in patterns of place, however, but also in rhythms of time (Jones, 2010; 197). It therefore stands to reason that when making decisions about the future of socio-ecological systems, we should operate with an eye to what Holland and O'Neill (1996) call *diachronic integrity* within place narratives. Diachronic integrity, as a principle of environmental ethics and conservation, requires us to consider environments within their temporal, or diachronic, contexts before determining how best to carry on their narrative by asking '*what would be the most appropriate trajectory from what has gone before?*' (O'Neill et al., 2008; 196). At its core, the concept is concerned with maintaining some form of coherence in a place's 'character' through time by avoiding sharp breaks in its story, such as for example, change on a grand scale that creates incongruity and strangeness (Brady, 2019).

This is not to say that all change must be avoided, rather the onus is on the *qualities* of the changes taking place, and whether they are perceived as being appropriate within a particular context. Changes that are perceived as inconsistent in relation to the story, the 'sharp breaks' in Brady's argument, disrupt the flow of place narratives and compromise their integrity, or soundness, changing the character (or sense) of place in ways that are perceived negatively. The notion of diachronic integrity therefore does not seek to stop change, but rather seeks to direct 'appropriate' change. How places are experienced, both sensorially and through an understanding of their historical background (including ecological, social, cultural and political), plays an important role in this process (Belhassen et al., 2017). Taking a diachronic approach to place narratives requires us to take on board these considerations when deciding how best to conserve an environment's character in relation to past, present and future changes (Brady, 2019).

Using a narrative approach to place/ landscape is not without its criticisms, however. A focus on place-based narratives, for example, can be accused of valuing some places above others whilst also imposing a romanticised and often static view of cultural landscapes as unchanging (Brook, 2018). Assessing how well lives are going through narrative and history, however, does not deny nor challenge the need for change (O'Neill et al., 2008). Rather, a narrative approach to place/landscape serves as a conceptual tool for understanding the story of how a place got to its present state through many changes and developments over time (Brook, 2018; 430). Additionally, it is important to note that there is rarely a singular, unifying narrative of place. Tensions exist between cultural and natural narratives, for example, which arise from the differing scale and pace of change between the two (Holland & O'Neill, 1996). Tensions also exist within cultural narratives, as some voices can be subverted by the more dominant discourses of the powerful and privileged. However, as noted by Brook (2018), acknowledging these tensions opens up a conversation about

landscapes, and their associated meanings and values, through which multiple voices can be heard.

Despite the relevance of narrative approaches to CES as highlighted above, few scholars in this field have attempted to incorporate narrative into their research (notable exceptions include Bieling (2014), Ratter and Gee (2012) and Ryfield et al. (2019)). Here, we contribute to this burgeoning CES literature by drawing on the in-depth place narratives of two coastal case-study sites in Wales (UK) to explore how people experience and understand landscape change in relation to their sense of place. Focusing on how people narrate lived experiences of landscape change, we give specific attention to the contextual sense-making processes associated with people-place interactions, and what this means for participants' wellbeing.

CONTEXT

In this paper, we present our work as part of the interdisciplinary CoastWEB[2] project, which aims to understand the contribution that coastal wetlands, saltmarshes in particular, make to human health and wellbeing in the UK at both local and national scales. Our contribution focuses on exploring localised cultural values at two Welsh case-study sites; the Taf estuary in Carmarthenshire, south Wales; and the Mawddach estuary in Gwynedd, north Wales (Figure 1).

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[2] Full title: Valuing the contribution which coasts make to human health and wellbeing, with a focus on alleviation of coastal hazards.
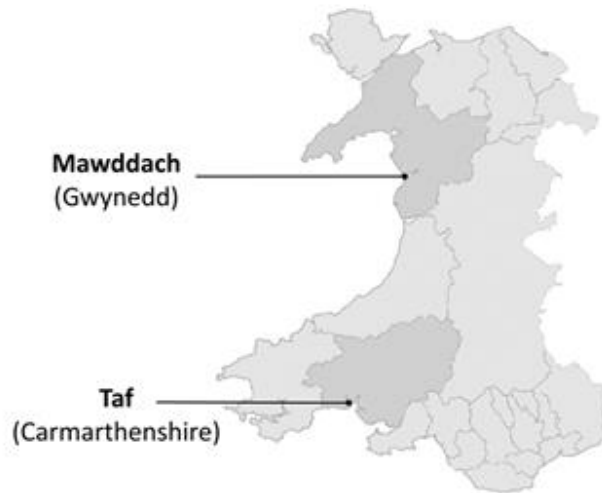
Figure 1The location of our case-sites in Wales, UK Map: "Wales_location_map.svg" by NordNordWest, used under CC-by-s.a.-3.0 / Modified by CoastWEB team.

Case-study sites

Despite their distinctive histories and geographical differences, the two case-study sites have much in common. Both rivers, for example, flow through open and varied landscapes to eventually form wide, sandy estuaries that, along with their hinterlands, are considered important landscapes of cultural as well as natural heritage.

Boasting long and complex land-use histories spanning thousands of years (Gwynedd Archiological Trust, n.d.; NRW, 2015a), the case-sites are steeped in history; from place-names reflecting past human influences and ecological/geological features[3], to the stories, legends, ruins and wreckages scattered along their respective coastlines. In contrast to their contemporary images as peaceful and pristine 'natural' landscapes, the estuaries were once teeming with activity. Agriculture[4], resource extraction[5], fishing/shellfish harvesting, and coastal trading have all historically thrived at both locations until their decline in the late nineteenth century.

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[3] A common feature of Welsh place names in particular

[4] Traditionally a mainstay of the local economy at both case-sites, although its role in has somewhat diminished in recent times.

[5] For example; lime (Maw & Taf), slate (Maw), coal (Taf), iron (Maw & Taf), gold (Maw), timber (Maw)

Along with this rich cultural history, the Mawddach and the Taf are also designated Special Areas of Conservation (SAC) and Sites of Special Scientific Interest (SSSI) of national and international importance (NRW, 2015a; 2015b) due to their varied and extensive intertidal habitats, supporting a wide range of rare plant and wildlife species. For over two hundred years, visitors from nearby industrialised towns and cities have been drawn in by the appeal of the striking scenery, and tourism has since become the mainstay of the local economy at both sites. The popularity of the estuaries has subsequently made them desirable places to live, and decades of in-migration has shaped the distinctive identities of the waterside communities[6] into what they are today.

The future of the communities straddling the estuaries, however, is being called into question because of climate change and the accompanying risks presented by volatile coastal processes, including sea-level rise. The approach to flood risk management on the Taf has involved permitting natural coastal movement whilst providing individual flood protection to 43 properties in the township of Laugharne. There remains a risk of coastal flooding and erosion at Laugharne, however, the local community opted to forego the construction of a surge barrier due to concerns regarding its aesthetic impact on the township (NRW, 2015a). On the Mawddach, under the current policy of 'hold the line', a scheme protecting the coastal village of Fairbourne from potential tidal and fluvial flooding - involving strengthening existing tidal defences and river flood channels as well as the creation of compensatory saltmarsh habitat - was completed in 2015 (SNPA, 2016). From 2025, however, the approach to flood risk management adopted by the Council is one of 'managed retreat' - an adaptation strategy involving land-use change and the relocation of existing coastal defence infrastructure and communities further inland – which will be followed by a policy of 'no active intervention' (i.e. letting nature take its course) from 2055 (Haskoning UK, 2012).

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[6] i.e. distinctive from their more Welsh-speaking hinterlands.

Method

We used purposive and snowball sampling techniques to recruit twenty-six participants - twelve at Laugharne (Taf) and fourteen at various locations along the Mawddach[7] - in the Spring/Summer of 2018, with the view of exploring a wide range of perspectives and experiences at the coastal case-sites. Recruitment involved identifying potential participants either through local gatekeepers and by the researchers positioning themselves in high-traffic areas at the respective case-study areas (for example in pubs, cafés, shops). Our purposefully heterogeneous sample consisted of adults – 13 men and 13 women - ranging in age from their 20s-70s, which engaged with the coast to varying degrees; through work (including land managers, outdoor recreational practitioners, a boatman, local councilors, and a student), hobbies (including a litter picker, environmental/wildlife volunteers, members of walking groups, and a dog walker), and/or living locally (defined as living in one of the settlements along the respective case-study sites), as well as a small number who occasionally visit the case-study sites from further afield[8]. To draw out a narrative understanding of place, we employed a multimodal qualitative methodology that attends *'to a variety of modes that surround us (visual, verbal, audio, spatial)'* (Henwood et al., 2017; 601), which is particularly relevant when interested in the multi-faceted qualities of people-place relations and interactions in-situ. Designed to be open-ended, our methodology offered our participants ample opportunities for expressing their values in the manner most comfortable to them.

Our bespoke methodology consisted of three phases. First, participants were asked to take/gather photographs of things they encountered that they felt were of significance or

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[7] Travelling 9 miles in-land, the Mawddach estuary has more settlements along its shores than the Taf. The settlements along the Mawddach that were included in the research are Barmouth (*Welsh: Abermaw/ Y Bermo*), Fairbourne, Arthog, Dolgellau, Penmaenpool (*Welsh: Llyn Penmaen*) & Llanelltyd.
[8] Including those that have grown-up in/ have a prior connection to one of the settlements along the respective case-study sites but have since moved elsewhere.

value during their interactions with the estuary/coast[9] for later use during the third phase (*see* Thomas et al., *In Press* for further detail). Second, participants took researchers on a semi-natural 'go-along interview'[10] (Hall, 2009) along a personally significant route at the estuary/coast, where they were encouraged to lead the conversation whilst being guided to think about their experiences, thoughts and feelings about being by the coast and its impact on their wellbeing. Third, participants were invited to take part in a sit-down interview, where they were encouraged to reflect on the topics raised during the go-along through the use of three further tasks; photo-elicitation, mapping and word associations. For the photo-elicitation task, participants were encouraged to discuss the personal significance of the photographs they had provided of their relationship with the coast. Next, participants were asked to annotate an Ordinance Survey map, provided by the researchers, with insights about their interactions with the coast (e.g. favourite/least favourite places, memories, stories, frequented routes etc.) and how this relationship affects their wellbeing. Lastly, participants were presented with 47 word-cards and asked to comment on anything that came to mind, with the view of prompting discussion on topics that they felt were important but had yet to be covered during the interview so far. Our open-ended approach to interviewing provided us with *'routes into the relational nature of space and place'* allowing insights into *'the meaning, and the way that places are made'* (Bates, 2019; 11). Asking participants about their memories, experiences, feelings and embodied interactions with place also enabled us to explore their personal expressions of wellbeing, and how they may have changed over time (Bell et al., 2015).

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[9] If participants did not provide photographs, the research team had with them a photo stack of various coastal scenes and details, some of which were generic, and others specific to the case-study sites.
[10] Participants were asked to suggest a route along the estuary/coast that took around an hour to complete. A sensitivity to a range of experiences as well as capabilities was of upmost importance, thus we encouraged participants to also choose the mode of movement (i.e. walking, boating, canoeing or cycling).

Interviews were conducted according to participants' linguistic preferences[11], and were audio-recorded using field recorders with lapel mics, and GPS-tracked. The audio data was later professionally transcribed/translated, before being coded by the researchers using NVivo 11 software. An inductive approach to coding was taken, whereby themes arose from the researchers' reading of the raw textual data. Themes relating to a sense of place and landscape change at various spatial and temporal scales were identified as significant at both case-sites and formed the basis of our line of inquiry. The process of analysis started by looking at the landscape changes participants noticed at their respective case-sites, before widening out to knowledge of wider socio-cultural changes, both historic and recent. Later, we used cross referencing analysis to explore the nuances expressed in the people-place narratives of the two case-sites, and to harness, clarify, and utilise insights that had been generated from the situated encounters (Sørensen et al., 2018). The resulting insights were developed through the constant interplay between the data, the researchers' developing conceptualisations and their experiences (Henwood & Pidgeon, 1992). In accordance with protocols approved by the School of Social Sciences Research Ethics Committee at Cardiff University, all names presented here are pseudonyms (apart from one participant, who requested we use their real name), proceeded by where the in-situ interview took place.

FINDINGS

Narrating intertidal landscapes: Natural changes and rhythmic affects

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[11] Either in Welsh or in English

At both case-sites, participants commented on the dynamic nature of the ever-changing estuarine landscape(s). Rhythmic changes manifest at multiple spatio-temporal scales – in the diurnal ebb and flow of the tide, processes of erosion and deposition[12], the steady migration of river channels, and seasonal transformations – were cited in overwhelmingly positive terms. Changes in colour and light, dependent upon *when* the estuary was encountered and weather conditions met, were also discussed by participants as part and parcel of the case-sites' appeal, making the intertidal zone an '*interesting*' place to be (Nia, 50s, Fairbourne - Maw).

> *Well again, I think it's the light, erm, it's different every time you*
> *go down there. It can be dull or windy or cold or snowy or rainy,*
> *it's different every time.*
>
> (Kathleen, 60s, Penmaenpool - Maw)

> *I suppose that's the other thing about the [estuary] walk. Nothing*
> *stays the same. It's constantly changing, so you're getting that*
> *different stimulus all the time. And no walk is ever the same.*
>
> (Charlotte, 40s, Laugharne - Taf)

> *I like it because it's consistently- although [the estuary] is, but*
> *then, at the same time, I always say, it is changing all the*
> *time […] depending on where the tide is or where the light is or*
> *what the weather's like, it's always different, but it's reassuringly*

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[12] Whilst the processes of erosion and deposition were often discussed in relation to saltmarsh formation, participants also recognised the role of land reclamation in the shaping of the coastlines at both case-study sites.

always the same […] and you don't get bored of it because it is

always different. Like the colour of the water from one day might

be different the next. So, it's not boring.

(Rachel, 30s, Laugharne - Taf)

As highlighted in Rachel's quote, 'natural' and rhythmic changes were viewed as fleeting yet familiar, generating a sense of comfort for participants. This sense of comfort was also communicated through participants' expressions of the tidal landscapes as being "*quite timeless*" despite their dynamism (Jennifer, 30s, Black Scar - Taf).

Witnessing/encountering rhythmic and cyclical changes generated a positive affective state, which was often described in terms of an appreciation of being a part of something bigger than oneself (i.e. nature), enhancing participants' relationship with place; "*I get that real sense of connection, protection, awe… sense of peace… of wonder*" (Phoebe, 40s, Penmaenpool - Maw). While participants often defaulted to discussing how their visual engagement with the estuarine landscape affected them, references to their other senses as part of the embodied, multisensorial experience of encountering the estuaries were also made. Of particular interest was how, in contrast to the rhythmic changes of the seasons and tides, sudden changes could change 'the feel' of an encounter. A sudden turn in the weather, for example, could as easily enhance a walk as it could mar it; something that Lilly experienced during her 'go along' interview, which she later discussed in the sit-down interview:

Walking back and it starting to get windy and the sand like

whipping up into your eyes, it does make a bit of a difference. It's

not become negative, no, but, it's a bit different from how relaxing

it was […] like, what I was saying before, about it's a really

exposed area, so if the weather changes quickly, then suddenly it's

just like driving wind and rain, you can get cold really quickly.

So, it's just how the environment can change really quickly once

you're out there, if you're on a walk or something. You've got to

be well prepared for it.

(Lilly, 20s, Barmouth - Maw)

While Lilly disliked the sensation of feeling cold and of sand on her skin, others sought out such experiences by deliberately venturing outdoors when the weather conditions were "*wild*", giving them a sense of drama and danger (excitement) from experiencing the "*force of nature"* (Charlotte, 40s, Laugharne - Taf), as well as a sense of achievement and tranquillity following the exhaustion felt after *"battling the elements"* (Trystan, 30s, Llanelltyd – Maw). Clearly, the underlying motivation/intent one has for engaging with the environment and whether one is equipped for unpredictable conditions, matters when considering how sudden changes affect people's experience of place. Such affects, however, were as fleeting as the weather, and having one less-than-pleasant encounter did not seem to deter participants like Lilly from returning time and time again.

The way we were: Narratives of localised socio-cultural change

Changes in the relationship between the estuaries and their local cultures were often discussed by participants, with references commonly made to socio-economic transformations (spanning decades and even centuries) at both case-sites. For example, those that were most familiar with the estuaries, displayed a strong awareness of their industrialised heritage, conjuring imagery of much busier landscapes compared to the present-day. References were commonly made to the waterways' key role in shaping place identity. At Laugharne for example, coastal trade and cockling were identified as "*vital in the past*" (Alan, 60s, Laugharne - Taf), being "*one of the things that sustained the populations to stay*

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in the local economy" (Brian, 60s Laugharne – Taf). By the early- to mid-twentieth century however, the number of working boats on the estuary had plummeted, commercial cockling had ceased, and the cockle factory had moved elsewhere, giving way to tourism as the mainstay of the locality. Despite its

diminished economic importance, however, the cockle continues to permeate the very fabric of Laugharne - with its shell appearing on the Coat of Arms of the Corporation and the Portreeve's Chain of Office, used in building materials, scattered as grip, and even buried by the bucketful in people's gardens - serving as a constant reminder of past generations' reliance upon the humble shellfish. Perceptible monuments to historic people-place relationships such as these, generated a deep sense of belonging to a place through one's heritage;

> *[…] the history, you know, the cockling and the cockle gatherers*
>
> *and the coastal sailing ships. And that history of Laugharne and*
>
> *the saltmarsh, again, it adds to your sense of identity and your*
>
> *connection with your environment and sense of wellbeing…yeah*
>
> *[…] I do think when I'm walking this, about the women cocklers,*
>
> *you know, carrying their cockle loads on their heads.*
>
> (Charlotte, 40s, Laugharne - Taf)

> *[…] you know that stone wall, on the slope? […] Someone has*
>
> *had to build that stone wall. Without life insurance, without nine-*
>
> *to-five hours, without an hour's break at lunchtime, you know,*
>
> *in all weathers. Horrible […] It's referring back to the history of*
>
> *the place […] Because it's not like today, where it's just all*
>
> *tourism, but that's where people lived and had to walk […]*

I dunno, it's just interesting, isn't it? Just seeing the history with where the drovers would go, where people have been up in all sorts of weather building these stone walls and using various materials [...] It's just that connection with what was, as I said, centuries and centuries ago... with now. I just think that's something ... interesting.

(Trystan, 30s, Llanelltyd - Maw)

Whilst these physical remnants served as symbolic reminders of a different way of life, they also provided opportunities for new socioeconomic relations between people and place to form as well. For example, since its commercial closure and abandonment, the disused railway line on the Mawddach and old cockling paths at Laugharne had been reclaimed and given a new lease of life as popular leisure attractions for walking[13]. By providing opportunities for leisure, these vestiges of old industries contributed to contemporary peoples' sense of connection to place by providing access not only to cultural, but to natural heritage as well;

[…] sometimes I'd catch the train and then, there's a station not that far from here, and then you can get off there and then just like cycle up and down the Mawddach Trail […] It's quite cool as well because I remember one time we went in the evening and, me and my brother, and we managed to spot some otters in the estuary, it was amazing! That's one of the only times I've managed to see them, which was pretty cool.

(Lilly, 20s, Barmouth - Maw)

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[13] As well as cycling and canoeing/kayaking in the case of the Mawddach.

The way they were: Narratives of ecological change

References were frequently made to changes in the plant and animal communities encountered when moving through the landscape. For example, certain plant species were reported to have become problematic in recent years, with participants at both case-sites mentioning invasive species such as Japanese Knotweed and Wireweed, and showing an awareness that land managers periodically removed plant species that were felt to be "*taking over [...] just not doing any good*" (Louise, 60s, Laugharne - Taf) as they "*suffocate everything else*" (Trystan, 30s, Llanelltyd - Maw) along the rivers. On the Mawddach, the invasive plants not only impacted the local ecosystem, but had changed the building practices of those that lived along the estuary; "*local builders always used to just take sand and gravel form the river and there was no problem. But they can't now, it's against the law*" (Kathleen, 60s, Penmaenpool - Maw). Participants referenced the presence of invasive plant and animal species along coastal waterways as stemming from the movement of people, for trade in the past and leisure in the present; "*they bring their boats, they clean them off, they move on...and you'll find an invasive species*" (Phoebe, 50s, Penmaenpool - Maw). Whether the sightings of invasive species were *"just a freak incident" or* whether they were gaining a foothold was yet to be decided, Phoebe continued, but the success of some species in the coastal waters around the Mawddach, such as the Japanese Wireweed[14], was a *"real sign that our oceans are warming up, because it's Japanese, it shouldn't be here"*.

While some invasive species had been unwittingly transported to the case-sites by visitors, others seemed to have come of their own accord. Once a rarity, little egret sightings had become more common over the last decade at both case-sites, with Susan (60s, Laugharne – Taf) musing that the egrets' range must be expanding further north; '*They weren't here ten years ago [...] I suppose it's because of climate change, you know, they're*

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[14] A waterborne equivalent to the notorious Japanese Knotweed

moving… the warmth is moving up”. In stark contrast to the earlier discussion about plants, most participants enjoyed spotting the personable birds. Bill and Alfie (both in their 70s, Laugharne – Taf), however, were concerned about the growing presence of the egrets, particularly as the numbers of nesting herons had seemingly declined. Alfie in particular discussed how he had "*enjoyed seeing [egrets] at first, but not anymore”,* as he felt that the herons no longer nested at their usual spot a short distance from the township; *“I blame it on the egrets […] I don't know whether they got on with the herons or what, but you'd see white and grey, obviously nesting as well, and all of a sudden – well, this year – there's nothing there… So, why?”.*

The dwindling numbers of native species was a recurring theme at both estuaries. Fish stocks in particular were felt to be suffering, with salmon, sewin[15] and cockles (the former at both case-sites and the latter only at Laugharne) most often mentioned. In stark contrast to the scarcity of the present-day, some participants recounted warm memories of days gone when fish were bountiful;

> *My friend lives on the other side of the river... His father has a little rowing boat, and I think...there are only two licences now to go netting on the river. So, he's had one of them for years I think and his father or his grandfather had the licence too, like, so he's still at it. He's almost eighty, and then he goes out and rows with the net like you know. He doesn't catch hardly anything now, because there aren't as many fish in the river now […] I remember going with him years ago...coming in with a net full of, you know, mullet and there was salmon then. But they hardly ever catch salmon now, you know.*

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[15] Sea trout

[…] catching salmon with a net with my father in the moonlight.

That was lovely. You could hear the salmon, but you couldn't quite

see them. But my father, I don't know, he had a sixth sense about it

all. He could say, let's go 'round in, and there would be a couple of

salmon. I'm going back to the 60s. Salmon aren't like that anymore.

We used to sell them [to] a fishmonger in Tenby […] Keep him going

actually, through the summer. Oh yeah, that's how good it was, but

those days are gone.

Now in marked decline, these species are subject to strong protections and heavy restrictions on fishing and harvesting. The cause of the declining populations was felt to be uncertain, as participants commonly mentioned disease (in the case of the cockles at Laugharne), pollution from past industrial activities (particularly on the Mawddach), runoff from farms upstream (both), and commercial overexploitation as potential explanations (both). Such opinions indicate that participants believed the decline was due to anthropogenic causes, whether near or far, defined by some as increasing "*pressure*" on natural resources; *"there's certainly more – what can I say – more people doing things which I suppose puts pressure on local wildlife, doesn't it?!"* (Alfie, 70s, Laugharne – Taf). New approaches to coastal management were additionally identified as a potential source of change to local plant and wildlife. At the Mawddach case-site, the deliberate breach of an embankment near the coastal village of Fairbourne by Natural Resources Wales (NRW) in 2015, had been met with dismay from some locals. Linda (50s, Fairbourne - Maw), for example, stated that the breach was felt by some in the community to have threatened a local business that periodically used

the land. The breach had also reportedly devastated skylark nesting grounds that were in view of Linda's back garden, and had decimated a wildflower meadow on the outskirts of the village, making the land look "*bleak*" and uninviting; "*even the rush looks like it's dying [laughs]*" (Nia, 50s, Fairbourne - Maw). This was particularly perplexing for Nia, a regular user of the wildflower meadow for walking and picnicking, as she did not understand why NRW breached the embankment, suggesting a lack of communication between the land management organisation and the local community that stood to be affected. Further along inland, lapwings and rare flowers were also felt to have become scarcer in recent years, a trend that was attributed to ecological conservation efforts (Ioan, 40s, Arthog – Maw). Ioan talked at length about how he had witnessed nesting lapwings disappear from his land, which he attributes to a growth in the local badger[16] population following the implementation of policies that protect them. He also discussed how the local area had once been famed for its rare flowers, which have since disappeared;

> *[…] the salt marsh at Fegla Fach here was famous years ago with*
>
> *the small flowers- Those at Arthog school used to have a lesson- this*
>
> *was in spring and summer [they would] go down to the saltmarsh*
>
> *here, to see the different plants, but … since they've been protected,*
>
> *they've disappeared […] Well, the old farmer back in the day who*
>
> *was farming when I was a child, I remember he'd burn different*
>
> *parts. He had a rotation, you know. They've stopped them from*
>
> *burning, and the growth has grown and it's suffocated- you know the*
>
> *old hard grassy stuff- It's suffocated the small plants and*
>
> *smothered them, and they've died, you know. Which is a shame to be*
>
> *honest. They don't realise the value of the little sheep just lightly*

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[16] Badgers predate on lapwing eggs

grazing... I'm not saying you should over-graze but graze at the right

time. A date on the calendar is good for nobody, because every

season is different [...] You just have to learn from experience. It

gets passed down from generation to generation. Everyone knows

about their own farm or their own land, like [...] an x on the

calendar saying you can't put sheep there until that date is good for

nothing. It's too late, or too early... Very often it's too late and the

overgrowth has come, and things don't eat it, like, you know.

(Ioan, 40s, Arthog - Maw)

The concerns raised by Linda, Nia and Ioan about the decisions of, and actions taken by, policymakers/land managers suggest that they are perceived as being neglectful, disruptive and dismissive of local complexities, both cultural and natural. For Ioan in particular, the disregard shown towards generations of emplaced ecological knowledge, and the consequent mismanagement of natural resources draws many parallels with critiques of conservation elsewhere (see, Wynne-Jones et al., 2018; Brook, 2018).

Anticipated futures: Finding a balance

When discussing the future of the estuaries, participants at both case-sites strongly expressed preferences to conserve the landscape as it is (i.e. naturally dynamic) for future generations to enjoy as they have, lest people "*lose their connection to nature*" (Fred, 70s, Penmaenpool - Maw). For Nia, her desire for the landscape to remain as it is reflected in her wish for an emplaced intergenerational connection to her future descendants;

[the Mawddach] hasn't changed at all since when I was a small

child. There's something quite comfortable in that, isn't there?

That things don't change and that it's going to be exactly the same

21

for my… grandchildren, if I have any. And they'll be able to say

that Nain[17] used to look out at exactly the same thing as they've

looked out on, you know?

(Nia, 50s, Fairbourne - Maw)

Potential changes that could disrupt the natural dynamism and evolution of the estuarine landscapes included possible development of housing and leisure facilities (e.g. marinas), 'hard' coastal defences (sea walls), and rather paradoxically, efforts to preserve the estuaries aesthetically as they are rather than letting them develop naturally (e.g. dredging/walling). Most participants displayed a preference for allowing nature to take its course, using statements such as; "*there's a natural balance*" (George, 20s, Laugharne - Taf), "*you shouldn't mess with nature*" (Rachel, 30s, Laugharne - Taf), "*the ecosystem works, unless man destroys it or interferes too much*" (Linda, 50s, Penmaenpool - Maw), and "*I think we should back off and leave [the estuary] to it… It's done beautifully for millennia all by itself. It really doesn't need us, beyond protection*" (Phoebe, 50s, Penmaenpool - Maw).

For those interviewed at the Mawddach[18], perceived 'interference' by human hands had already changed estuarine dynamics in less favourable ways. The building of a concrete causeway to Ynys y Brawd (Welsh: Brother's Island - once a small tidal islet separated from Barmouth by the narrow North Channel of the Mawddach river)[5] in the early 1970s had closed the channel between the islet and the mainland to preserve public safety. While participants recognised that the intervention was underpinned by legitimate concerns regarding risk management, it also had unforeseen consequences as it "*changed the way that the sand was moving*" (Lilly, 20s, Barmouth - Maw). Specifically, participants noted that the altering of the mouth of the estuary had resulted estuarine silting as well as the development of a dune

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[17] North Walian dialect meaning 'Grandmother'
[18] Similar trends were evident at Laugharne as well, albeit not as prevalent as on the Mawddach

system where there had previously been none, both of which had been steadily effecting people's engagement with the water/coast in both active and passive ways. The sudden formation of an extensive dune system along Barmouth promenade was felt to have impeded passive engagement with the sea, because "*when you walk along the prom there, you can't see the sea because of the sand dunes. Whereas, you used to be able to see the sea, it was just completely flat*" (June, 60s, Barmouth - Maw). Similarly, the silting of the river impeded active engagement with the water, as it meant that large boats such as river cruisers and RNLI lifeboats (Peter, 60s, Caerdeon - Maw) could no longer venture upstream as they once had in the past; "*They actually used to build boats up here and float them down. You couldn't do that now, you'd just about get a canoe up there now*" (Kathleen, 60s, Penmaenpool - Maw). Indeed, according to Ywain (30s, Abergwynant - Maw), canoeing on the Mawddach at low tide is often difficult given that there can be as little as six inches of water to float on.

Despite participants' preference for 'leaving nature alone', some tempered their preference with a recognition that some level of management is needed, particularly when facing a changing climate; "*I think it's something that you just manage gently, minimum interference […] kind of low-key interventions, that sort of thing*" (Brian, 60s, Laugharne - Taf). Along the Mawddach, Ioan (40s, Arthog - Maw) was in favour of further human interventions as he was gravely concerned about the silting compounding the risk of flooding along the low-lying settlements of the estuary;

> *In my opinion, they'll have to dredge the Mawddach at some point,*
> *or Fairbourne and Barmouth will really suffer […] The water will*
> *flood them…They'll drown. And- Well, it's going to have an effect*
> *on Dolgellau as well […] [the silt is] going to back up water, isn't*
> *it? Not the sea water, but water which comes down from the*
> *mountains, you know. Water finds its level, you see, and when*

you've blocked a part, well you don't know where it's going to find

the level then do you? To break through, like, you know.

(Ioan, 40s, Arthog - Maw)

A tension between others' preference for 'letting nature be nature' and the need to manage the coastline is evident in Ioan's quote. Along with the threat of rising sea levels as a consequence of climate change, such tensions are likely to become more commonplace along both coastlines.

DISCUSSION

The stories people tell about a place, reveals much about the meaningfulness of situated human-environment relations (Tadaki et al., 2017). Our narrative work highlights how highly perceptible natural rhythms and cycles are an integral part of meaningful interactions that make up a sense of place at coastal/intertidal landscapes (see also Jones, 2010). Specifically, how participants discussed the *qualities* of landscape change encountered during their everyday environmental interactions offered us a way exploring the dynamic between their sense of place and wellbeing through time. Interpreted either through a lens of *continuity* or *disruption*, landscape change impacted place narratives, and participants' sense of wellbeing, in various ways.

Through the lens of *continuity*, feelings of wellbeing were expressed as a deep-seated, lived connection with cultural and (seemingly uninterrupted) natural heritage over time. For example, in participants' discussions of *natural changes and rhythmic affects*, cyclical natural processes were celebrated, positively affecting participants through an aesthetic appreciation of complexity and variability in a familiar environment (*see* Lengen, 2015). Such processes were part and parcel of what participants perceived to be a 'stable' natural system, where stability is characterised by cycles of dynamism rather than stasis. The persistence of

rhythmic change was integral in shaping participants' wellbeing, which was often expressed through feelings of comfort (i.e. through things always changing but staying the same) as well as a connectedness to nature (i.e. in witnessing and experiencing these changes). Discomfort also played a role in shaping an emplaced sense of wellbeing for some of our participants, as they discussed affective experiences of (temporarily) uncomfortable interactions with the landscape (i.e. physiological discomfort from bad/sudden changes in weather) in positive terms. Such findings point to the role that multiple temporalities – hourly, daily, monthly, annual and even longer time-scales – have in shaping a sense of dynamic stability that is deeply valued by participants at both case-sites.

In participants' *narratives of socio-cultural change*, natural and cultural heritage (in the form of industrial relics) were perceived as being in harmony with each other. Here, *continuity* was derived from the connections to heritage as well as nature that participants felt through their embodied interactions with the industrial relics scattered in their local landscape – albeit for different purposes than their original functions – as well as the retelling of their stories. Following the assertions of Taçon & Baker (2019), cultural heritage for our participants is '*an essential part of who and what we are, where we have come from and where we are going'* (p.1310) and played a crucial part in shaping their emplaced sense of wellbeing by re-storying the relationship between culture and nature in more harmonious ways (*see also* Poe et al., 2016; Brook, 2018).

Disruptive changes on the other hand, were those that were perceived to disturb natural rhythms and impact personal/collectively shared place meanings and embodied interactions with the estuarine case-sites in negative ways. Such changes were often interpreted as resulting, either directly or indirectly, from anthropogenic activities; perceptions that were expressed in our data through narratives of *meddling and loss*. Such narratives were encountered in participants' discussion of *ecological changes* and *anticipated*

futures, where feelings of loss were attributed to the incremental changes encountered in the landscape, evidenced through the increasing presence of invasive plant and animal species as well as through alterations in localised biophysical processes. Such changes were encountered in active and passive ways, as dune formation disrupted passive, or visual, engagement and connection with the sea, and silting disrupted active engagement with the water through limiting various access opportunities to the estuary. Interestingly, these are not sudden, or 'sharp', changes on a 'grand scale' as discussed by Brady (2019). Instead the cumulative, disruptive changes might best be thought of as a slow process of whittling away the meaningful connections and interactions that are so integral to the continuation of a coherent story of place through time. When discussing potential solutions to these disruptive changes (such as dredging the river), however, tensions arose between the need to sustainably manage the landscape and the need to 'leave nature alone'. Such insights reveal that participants understand coastal/intertidal landscapes as complex socio-ecological systems filled with competing legitimate claims that are difficult to manage. The question of how best to respond to potentially disruptive environmental change without exacerbating loss is, however, an inherently difficult one.

By attending to the affective qualities of places - through the meanings, attachments and embodied, sensorial interactions relayed in stories about them – we have revealed much about what is at stake when it comes to deciding the future direction of place narratives. The notions of continuity and disruption formed the central tenet to exploring diachronic integrity (Holland & O'Neill, 1996) in the narratives of the two case-sites, guiding our reading of the data and providing insight on how dynamic stability is deeply valued by participants at both estuaries. Asking about the future, however, revealed tensions between the need to preserve the integrity of such narratives and the need to protect people and property from rising sea levels. Tensions were expressed by our participants through narratives of meddling and loss,

derived from past experiences of 'inappropriate' changes that were perceived to disrupt the dynamic stability that characterised their sense of place, and impact their embodied interactions with the landscape that was integral to their wellbeing. Finding an appropriate way forward without compromising the respective case-sites' dynamic stability will by no means be straightforward however, as it entails a collective effort involving deliberation between the diverse interests of multiple groups (Robinson & Elliott, 2011). As noted by Brady (2019) and Brook (2018), there are no definitive answers, nor hard and fast rules when it comes to environmental decision-making, and it is rarely possible to please everyone. What place narratives, and the concept of diachronic integrity in particular, offers us is a frame through which to explore what matters to people in particular contexts, widening our conception of the valued CES within a place, and accordingly, providing a potential starting point for a more culturally sensitive and inclusive environmental decision-making process.

CONCLUSIONS

In this paper, we have contributed to the CES literature by drawing on the in-depth place narratives to draw out how people experience and understand landscape change in relation to their sense of place, shedding light on what participants perceived to be at stake when it comes to wellbeing in dynamic environments. Our qualitative, multimodal approach allowed for a sensorial and socio-cultural understanding of coastal/intertidal landscapes as valued but vulnerable environments. Like others before us (e.g. Bieling, 2014; Plieninger et al., 2015), our work highlights the importance of situated experience when it comes to people-place relations and place-making. Findings point to the need to appreciate a diversity of values, attachments and concerns expressed among communities/publics, both local and further afield, and the potential tensions between these perceptions (*see* Westling et al., 2014). In this vein, qualitative, multimodal methodologies can be used effectively to engage

communities/publics by enabling them to develop connections to intertidal landscapes through situated experiences and storytelling, fostering a deeper understanding of the values, needs, desires and fears for the future held by diverse groups. When it comes to policy, such insights lead to a recognition that values are not '*isolatable from the contexts of place, time and culture'* (Kenter et al., 2019; 1450) and that management decisions should be tailored to attend to community concerns.

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