



“This is the peer reviewed version of the following article:

The River Severn Estuary, UK, Bahía Adair, Sonora, Mexico, Jones, O. and Green, H. (2022) 'Rivers—mouths—tides—memories: a creative, inter-deep-mapping of two river/tidal places. Love of place, memory and affect; movements, patterns, marks, and practices of care', *River Research and Applications*, 38 (3), pp. 453-469.

which has been published in final form at <https://doi.org/10.1002/rra.3887> . This article may be used for non-commercial purposes in accordance with Wiley Terms and Conditions for Use of Self-Archived Versions. This article may not be enhanced, enriched or otherwise transformed into a derivative work, without express permission from Wiley or by statutory rights under applicable legislation. Copyright notices must not be removed, obscured or modified. The article must be linked to Wiley’s version of record on Wiley Online Library and any embedding, framing or otherwise making available the article or pages thereof by third parties from platforms, services and websites other than Wiley Online Library must be prohibited.”

ResearchSPAce

<https://researchspace.bathspa.ac.uk/>

This version is made available in accordance with publisher policies.

Please cite only the published version using the reference above.

Your access and use of this document is based on your acceptance of the

ResearchSPAce Metadata and Data Policies, as well as applicable law:-

<https://researchspace.bathspa.ac.uk/policies.html>

Unless you accept the terms of these Policies in full, you do not have permission to download this document. This cover sheet may not be removed from the document. Please scroll down to view the document.

RIVERS—MOUTHS— TIDES—MEMORIES

A creative, inter-deep-mapping of two river/tidal places: love of place, memory and affect; movements, patterns, marks, and practices of care.

The River Severn Estuary UK; Estero La Cholla and the larger Bahía Adair in Sonora, Mexico; Owain Jones; and Heather Green.

Abstract

This paper sets out the authors' attachments to, and memories of, two tidal river/channel landscapes and how these are being folded into collaborative work which brings these places to attention through art practice and shared reflection. The rivers/channels in question are given voice in the introduction and ideas of the ecologies of mouths and river mouths, particularly those tidal, are explored in the follow sections. Aspects of polyvocality and deep mapping are employed to reveal aspects of these places, and particularly their tidal patterns and rhythms and our concerns for them. An art project, *Tidal Timespace*, lies at the heart of this paper with the role of memories, shared memories, and our relationships to place as key themes. The descriptive accounts of the authors' respective place memories are set in the margins of the paper in two columns. We conclude with considerations of expanded notions of ecology, and we add that loss of place, the passing of time and wider senses of ecocide and extinction run like shadows through this narrative.

River Biographies

The River Severn (Welsh: Afon Hafren), at 220 miles (354 km) long, is the longest river in Great Britain.[4][5] It is also the river with the most voluminous flow of water by far in all of England and Wales, discharging an average of 107 m³/s (3,800 cu ft/s) into the Bristol Channel which runs on West to join the Celtic Sea and Atlantic Ocean. The Severn rises in the Cambrian Mountains in mid Wales, at an altitude of 2,001 feet (610 m), on the Plynlimon massif, and then flows through the English counties of Shropshire, Worcestershire and Gloucestershire. The lower reaches of the river are tidal and form the Severn Estuary. This is described in more detail in what follows and is, according to Bristow (2015), 'among the world's natural wonders' (1).

Bahía Adair, located near the mouth of the Gulf of California in Sonora, Mexico, extends 26 miles (43 km) from east to west and 12 miles (19 km) from north to south. The coastline consists of 104,800 acres of wetlands. There are three different habitats: the wetlands, artesian wells, also known as *pozos*, and salt pans. The wetlands extend along 47 miles (76 km) of the coast, from Punta Borrascoso in the north to Estero La Cholla in the south (H. Nalini Mozaria Luna). Estero La Cholla resides next to the small community of the same name, where Heather's grandparents have a cabin. All six wetlands are inverse hypersaline estuaries, created by tidal inflow in river-like channels.

Key Words: river; delta; mouth; inter-tidal; estuary; patterns; rhythms; art practice.

Contexts & Background

This paper is a co-evolved expression of memories; patterns, and marks made in places where rivers and tidal streams discharge into the oceans; of places where tides come and go, and create the quintessentially liminal spaces of intertidal zones; tidal river reaches and tidal marshes. Our account charts the physical distinctions of two distant landscapes and the process of collaborating on writing about our memories in a project called *Tidal Timespace: Imprints & Palimpsests*. The project aims to creatively explore the loved detail of the ecologies of each landscape, their uniquenesses, and their shared traits. These traits are very much about the rhythmic flows of water in these places, in part tide-driven, and the ecologies these are bound into. Drawing upon the practice of deep mapping—an emerging method of intensive topographical exploration that “works horizontally across the terrain and vertically through time” (Pearson 2006), these ecologies interweave nature and culture, past, present and future, dry and watery, and fresh and salty space. They include very rich biodiversities in the classic sense, but also ecologies of memory—as each landscape has been known to one or other author since earliest childhood—Heather Green with Bahía Adair in the Gulf of California (Mexico), and Owain Jones with the Severn Estuary (UK).

Once complete, the project will include many more elements—sculptural, auidial, and interactive. But here we focus on the written memory fragments of our two estuarine landscapes that have been in part lost to development. They are inscribed in the margins of this paper: Owain’s memories are on the left in italic, and Heather’s are on the right in roman text. We also explore these places as *river mouths*, and how these embody the corporeal, ecological, historical, and political attributes as such, and stand as metaphor for communication and creative exchange. We draw upon notions of polyvocality, that is the mixing of voices both human and non-human.

We see this paper as part of a wider global movement in arts and scholarship in which water is being creatively explored and appraised as an active and embodied, lively, life-enhancing element, fundamentally linked with bodies and places, such as hydrofeminisms (Neimanis 2017). The voicings of water, and water becomings, such as rivers, are perhaps only just beginning to emerge. For example, Richard Bright interviews Basia Irland about her explorations and writings on world rivers:

RB: You have written a series of essays for National Geographic about seeing from the perspective of a river. Can you say more about this? BI: It is indeed a privilege to be a writer transcribing the stories of our rivers’ moist stories. It has opened my eyes and my heart to the depth of knowledge a river accumulates over thousands of years as it traverses the land . . . *because every river has its own voice, personality, and problems*. I have written about rivers around the world, including ones in Thailand, Cambodia, India, China, Japan, Nepal, Canada, the United States, and Europe. Lucy Lippard writes, ‘The genius of these essays, [] is the fact that they are written in the first person, the persona of the river herself.’ (Bright & Irland 2018, emphasis added).

(Memory text in margins starts here? If I can make the layout work?)

(1) Mouths

Think of your mouth; its beauty and its complexity. Think of its ecology. Of the role it plays in *your* ecology; physical, cultural; social. Touch your mouth; someone else’s? Kiss someone? Now

think of a river mouth. Think of an estuary or delta¹. Mouths speak; mouths kiss; mouths eat; mouths breathe; mouths disgorge. If healthy, mouths are wet. Mouths teem with organisms. Mouths are sensual. Mouths sing. Mouths can be gagged, blocked. Mouths are key ecological thresholds; so, for humans, so for animals, so for rivers. This paper is a construct of words. Before written, words were spoken, they were mouthed. This could be read out loud, mouthed into whatever air, whatever space, is around you. You breathe in air, you speak out. Rivers take in, they give out.

(2) River Mouths (Estuaries/Deltas) and Global Ecology

In terms of global biodiversity, river mouths, where rivers discharge into larger bodies of water, are critical thresholds of ecology. Where the body of water is the sea or ocean, fresh water meets salt water, and this mix to make brackish water. Flora and fauna, organic and inorganic matter, and human movement all pass through river mouths, and distinctive ecologies and cultures form in these unique places.

Where the lower reaches of a river are tidal, water flows up the river through the mouth as the tide rises, and out again as the tide ebbs. The mixing of fresh and salt water is much more varied and dynamic, and liminal inter-tidal zones are also often present. A disproportionate amount of global biodiversity is in coastal zones, and within that in deltas, estuaries and liminal coastal margins such as these.

This is why estuaries are such vital habitats and landscapes. The word estuary is derived from the Latin “aestus” meaning tide, and referring to a tongue of the sea reaching inland (Hardisty 2008: 3); a twice-daily conversation and exchange between two bodies. But as well as a ‘tongue of the sea’ reaching inland on tidal rivers, all river mouths extend a tongue, a plume of fresh water into the sea. Smith (2002) in his study of the extraordinarily rich ecologies and cultures of the Amazon river mouth, retells reports from early European explorers, who, while still sailing far off the coast in Atlantic waters, knew they were on course for the mouth of some huge river by realising they were sailing in streams of differing coloured waters.

In the book *Wildwood* Roger Deakin makes the point that it is the rivers which connect the ecologies of woods and forests to ecologies of the oceans. For example, rivers carry organic matter such as leaf litter and wood litter and discharge it into sea where it is an important foundation of ocean ecology. This is just one example of the profound power of water(s)—differing waters—to shape the world very directly—physically, and all the cultural and ecological and political diversity that does, and does not, gather around that. Water has the power to move, hydraulically, emotionally, and affectively. Water is a key vector of life—the life blood of Gaia, rivers are central to its circulation.

Colin Welland (2009) similarly considers that rivers are the ‘arteries’ of the earth as they transport sediment and organic material from evolving land to evolving oceans over eons. This is anthropomorphic, yes, but expressive of the idea of the earth as a body of processes which currently

1. ¹ We see estuaries, and deltas as closely related forms of landscapes and ecosystems. Although there vary in a number of respects, from here on we mostly just use the term estuary.

modernity has been so dismissive of. Welland goes on to point out that ‘around a third of this natural volume is [now] prevented from reaching the oceans as a result of being trapped behind dams and other man-made obstructions’ (81). In other words, the mouths of many rivers are silenced, parched, degraded, or starved. We need to be thinking about the performativities of nature as embodied in the agencies of things like rivers. For Serres this is the bringer of new life and energy ‘the great primal or recursive rising of waters, the chaos that mixes the things of the world—causes, forms, attributions—and that confounds subjects’ (2003: 53).

Rivers and floods are makers of life and landscape. How do we embrace that? And, today more than ever, rivers also are a major part of the toxic ecology of industrialisation, modernity, and globalized consumer culture, carrying plastic and other pollutants such as waste pharmaceuticals to the oceans. In a wider view of ecology (Guattari, 2000) water and memory are utterly intertwined. (See also Illich 1985). We all in some way or other, live with water. We are all embedded in catchments, both in the water we consume and the waste we generate, and in all the different ways we use water; for power, transport, recreation, consideration, aesthetic production and consumption. Our bodies and our houses, are part of the local water catchment, just as the drains, the streams, the rivers, and the estuaries are. We are cellular beings. Memory is a cellular process. Water is key to the life of all cells, as an active agent, with many functions still not fully understood, for example that of ‘slow water’ in cells (Ball 2017).

(3) Severn Estuary: Tidal River(s)

As the water reaches the end of its journey down the river, the channel slowly widens out into the great Severn Estuary. This is a key example of one of the 1200 river mouths around the world that are the ecological wonders of estuaries. Many of these are fragile systems subject to degradation by pollution, resource extraction, reclamation and, increasingly multiple risks relating to climate change, sea level rise and storm events. As Uchiyama (2007: 1015) puts it

intertidal sediments play a key role in providing habitat for resident infauna, which act as a food resource for large communities of shorebirds []. Even when slight erosion occurs on tidal flats, it may have significant impact on the resident benthos.

The Severn estuary is 557 km² with 18 percent of this being intertidal (100 km²). It is macro-tidal (Haslett 2008), having the highest tidal range in Europe and the third highest in the world, with the sea level rising by as much as 14.5 metres (Avonmouth) in the space of about seven hours at the highest tides, and then falling away again. Approximately 80% of the estuary’s 370 km shoreline is lined with sea defenses which stop the very highest tides flooding low lying surrounding land (often reclaimed wetlands and salt marshes). Thus, the ecology of this estuary and river mouth has already been seriously reduced by human intervention. But the sea walls are, in many places, openly accessible, and used for agricultural and recreational purposes (e.g., a long-distance footpath; The Severn Way), and accessing/viewing the intertidal areas, so providing access to the landscape and nature that remain.

Generated by the never-ending gravitational *pas de trois* of earth, sun and moon, in conjunction with the Coriolis effect from the spin of the earth and other factors, the tidal rhythms are a key part of the aliveness of this landscape (and other tidal places) in process terms, creating huge, ever morphing vistas of shore, intertidal areas, sea, sky, space and light, and shaping elements of its

physical features, ecology, economy and culture in terms of spacetime rhythms. The higher tides wash up the tidal reaches of a number of major rivers (some through urban centres) that drain into the estuary.

So, the Severn estuary is, in fact, a polyvocality of rivers with, in clockwise order, the Rivers Taff, Rhymney, Usk (all in Wales), Wye (Wales England boarder), Avon and Parrett (England), opening into it and generally receiving tides each day. The exception being the Taff river, where a barrage built for ‘urban regeneration purposes’ (begun in 1994) across the mouth of this smaller estuary effectively stops the tides and the river’s mouth. On the River Severn the incoming tide, compressed into an ever-narrowing channel creates the famous Severn Bore, a tidal wave that runs back up the river about eighteen miles, to above the city of Gloucester. This entire rhythmic spectacle is ecologically and culturally significant and attracts residents, tourists, surfers and artists.

The tides are entangled with a multitude of materialities, practices and ecologies. The powerful flows which are forever mixing the salty ocean waters with the fresh water discharge of the river carry huge amounts of sediment in suspension with a highly complex and always transient geography of mud, sand banks and channels. Shifting, elemental landscapes engage all manner of social processes which include transport, recreation, conservation, archaeology, rambling, bird watching and beach tourism. These have complex temporal rhythms geared to the multiple sequences embedded in tidal cycles. The main sequences are the daily rise and fall of the tide in a semi-diurnal rhythm (tide rising and falling roughly twice in 24 hours); the monthly (lunar) cycle which shows a progression from spring to neap tides in response to the phases of the moon, and the seasonal (yearly) sequence of the tidal ranges which respond to the relative positions of the planets (e.g. spring tides at the equinoxes). It is important to note that, firstly, these sequences do not correspond to the more ubiquitous hourly, daily and monthly grids in any simple ratio, and, secondly, that the precise heights and times of tides vary with local conditions such as wind speed and direction, atmospheric pressure and the amount of fresh water issuing from the rivers.

Some 1,000,000 people live around the estuary (Barker 2008) in large urban conurbations and smaller, remoter rural settlements. The management of the estuary and its margins poses considerable challenges due to the highly dynamic nature of the tidal systems. The reach of the estuary across local and national legislative boundaries, and the many competing eco-system services the tidal flows bring compound this complexity. A set of sometimes conflicting demands is placed upon the tidal estuary, for example between recreational use, resource extraction, nature conservation, nuclear power generation, waste discharge, agriculture (grazing of salt marshes), transport needs, coastal management and development, and public access. There are significant pressures on the tidal Severn and its inter-tidal areas and eco-system services, as there are on estuaries and delta areas worldwide.

Barker (2008) suggests that the communities who live around the estuary (especially those in large conurbations) have ‘lost touch’ with the tidal/estuarine landscape and its rhythms, as technologies, work, transport and lifestyle practices have changed. For example, tide-determined ferry schedules have been replaced by large road bridges. The large ports around the estuary were, for centuries, tidal ports in the heart of the cities, with their working and commerce patterns tide determined rather than day night determined, then the ports were made non-tidal, and then new dock facilities

were built taking them away from city centres. Many smaller tidal harbours, which were hubs in busy coastal trading routes, have now closed.

Lefebvre (2004) describes four alignments of rhythms, arrhythmia, polyrhythmia, eurhythmia, and isorhythmia, which together represent a range of dissonance or consonance between rhythms and the varying consequences of such. We feel examples of these, particularly the first three, abound in and around the tidal landscapes of the Severn. And a key question now is what kind of physical and cultural traces, patterns, do these leave?

Today local residents are generally not connected to the tidal Severn by work, leisure, or casual acquaintance of locality may only occasionally experience a clash of tidal and diurnal rhythms such as a swing bridge disrupting rush hour traffic as a boat passes into port. Some cities might be at risk of flooding if high rainfall coincides with high tides (arrhythmia). Farmers who get the benefit of grazing livestock on the salt marshes will, on occasions, have to ensure their livestock is moved to safety at the very highest tides (polyrhythmia). Visitors to this landscape might notice the coming and going of birds, birdwatchers, and pleasure and commercial sea crafts, and other travelers that are timed to make the most of the tides (eurhythmia). These characterizations of rhythms are initially useful but we feel are not a sufficiently subtle and flexible framework to appropriately deal with the complexity of the rhythmic exchanges between inhabitants and landscape. The potentiality of sonification is to interweave rhythms of these types into accounts that engage with the complexity and interchange between them.

The upper estuary, or tidal river channel, at low tide, is a remarkable place to explore. Care is always needed, but it is easy to walk out onto firm sandbanks at low tide, and walk where, a few hours later the incoming tide will be running, and maybe the famous fish of the Severn; the salmon, eel and lamprey be swimming. But, sadly, the numbers of all these species using the river have dropped markedly. (See Green 2020 online <https://www.heathergreen-art.com/tidal-timespace>).

(4) Bahía Adair: Inverse Tidal Channels & Spring Mouths

Beyond the classic river estuary form, there are other types of mouths, channels and estuaries to be considered. Located in the Sonoran Desert in Mexico along the Gulf of California, Bahía Adair is a large wetland complex fringed with six separate estuaries. These meandering, serpentine channels are not created by river outflow, but by the ingress and egress of tidal water. They are ephemeral streams also known as ‘negative’ estuaries, or *esteros*. As no river is feeding them, they are created by an influx of water at hightide, exposed to evaporation, and become hypersaline. The result is a two-layer circulation but with a reverse movement; ocean water entering the estuary during high tides in the upper layer, and the hyper-salty water leaving the lower layer. So it has an inverse, or negative circulation. These estuaries are saltier at the top of the channel, less salty toward the sea. (Lavin, Godinez, Alvalrez: 1998).

Bahía Adair has the third largest tidal range in North America, with a 26 ft. vertical shift during spring and neap tides (Flessa: 1991), moving in a semi-diurnal tidal rhythm, much like that of the Severn. At low tide a vast expanse of tidal flats is exposed, but unlike the Severn, its flats are firm underfoot throughout, with a sandier, shellier texture caused from the bioturbation of stingrays and

ghost shrimp. These feeding excavations are created by burrowing and sifting, bringing up tiny shells to the surface and compacting sediments underneath.

Although the tidal channels and creeks of Bahía Adair are inverse, and so no fresh water is mixing with them—just 62 miles (100 km) to the north lies the mouth of the Colorado River, which ran freely from its headwaters in the Rocky Mountains into the Gulf of California until the early 20th century. This interchange of fresh and salt water created a giant estuarine delta and a rich, biodiverse sea. Like other desert river deltas, such as the Nile and the Indus River deltas, the Colorado River delta has been greatly altered by human activity. Decades of dam construction and water diversions in the United States and Mexico have reduced the delta to a remnant system of small wetlands and brackish mudflats. As reservoirs have filled behind dams and captured floodwaters, freshwater can no longer reach the delta, resulting in an altered seawater composition and impacting species such as the endemic Vaquita porpoise, the most endangered cetacean in the world.

However due to another anthropogenic flow of water of accidental agricultural runoff there is a new wetland at the mouth of the Colorado created from called *La Cienega de Santa Clara*. Created in 1976, it is fed by drain water from California farmlands and has become the largest wetland in the Sonoran Desert. (Brusca et al, 2017) The Cienega supports rare and endangered bird and fish species and is a nesting and feeding site for shorebirds and marsh birds on the Pacific Flyway. A separate project is currently in place which aims to rejuvenate the wetlands by releasing a pulse of water down the river delta. One can hope that the conversation between the river and sea can resume, if only intermittently.

In *The Secret Knowledge of Water*, Craig Childs (2000) counts the steady rate of water dripping from a desert spring, and describes how water can be calculated to the minute from one century to the next with the exactitude of a clock. Earthtime can be counted in water, not only from the rhythmic drops or flow from springs, but also by its weight—the memory recorded by transfigured stream beds, and from the ebb and flow of oceans and glaciers. Part of this memory for the Colorado River and Gran Desierto de Altar where Bahía Adair is located exists underground along ancient fault lines, and seeps up in a series of spring-fed wetlands. Locally known as *pozos*, these springs have provided vital fresh water resources to diverse flora and fauna and to travelers who have visited the area for centuries, and are peppered along the periphery of Bahía Adair. One can surmise that, deep underground an ancient network of fresh water is flowing. So the myriad of tidal channels of Bahía Adair become a kind of double negative, inverted in the travel from the sea inland, and mirrored from below in the veins of an unseen network that course upward in the mouths of springs.

Historically the coastal areas of Bahía Adair and the Northern Gulf of California have been sparsely populated because of the lack of abundant fresh water. Tohono O’odham pilgrims traveled on foot or horseback for days to collect salt and shells and perform initiation ceremonies up through the 1950’s, and it has been home to the Cucupá and Tohono Cei’d people, who developed ingenious methods of harvesting the dew that collected overnight for drinking water. (Nabhan, G., Hodgson, W., Fellows, F. 1989)

The small fishing village of Puerto Peñasco grew quickly between the 1960's–90's, becoming a popular tourist destination for US citizens from Arizona because of its proximity to the sea, a four-hour drive from either Tucson or Phoenix. Located just south of Bahía Adair, Puerto Peñasco is now a bustling tourist town, with fresh water being trucked in from aquifers further north. The landscape of the Upper Gulf can be a place of extremes and contrasts: from the quiet, arid desert beside a teeming aquamarine sea; the ostentatious American tourists, or *gringos*, alongside the modest existence of Mexican locals and fishermen; to the many half-finished block and mortar buildings, their skeletal rebar ribs rusting in the gritty salt air, adjoined by the ever-expanding construction of piers, condo resorts and golf courses growing like cancer all along the coast.

Of the six esteros of Bahía Adair, La Cholla is the only one that is easily reached and has open public access. Much of Bahía Adair's tidal sea and estero channels remain sequestered either because of lack of roads or private, gated ingress. For most, it remains a vastly unexplored, mysterious landscape only navigable by boat. Local fishermen launch their pangas from Bahía La Cholla during high tide, at low tide tourists explore tide pools and bird watch, and clambers walk out on the flats to rake for chione clams (*eurhythmia*). In winter months the lowest tides take place after dark, and require proper gear and flashlights to continue fishing (*isorhythmia*). These daily tidal rhythms create an ever-shifting liminal space of constant emptying and filling, revealing and concealing—a vast landscape of encounter in a more-than-human world, and a space that demands one's careful attention and consideration because of the quick-moving tides.

(5) Sharing Memories and Love of Place

Humans are embodied and thus emplaced beings. Our becoming through our lives is always somewhere. There has been much discussion in environmental literatures and human geography on the role of place and the loss of connection to place in the current ecological crisis that is modernity. The eminent philosopher of place Edward Casey suggests that modern enlightenment thought has disregarded place. Wendell Berry made the memorable statement that

“Our present ‘leaders’—the people of wealth and power—do not know what it means to take a place seriously: to think it worthy, for its own sake, of love and study and careful work. They cannot take any place seriously because they must be ready at any moment, by the terms of power and wealth in the modern world, to destroy any place.” (1991—cited by Heat-Moon 1991)

Place is, inevitably entangled with memory. We are always in place; we are always in memory. How these two forces constantly fold and refold in everyday becoming is vital in how we live, live with each other, and live with the earth through memories of places. Rivers (and river mouths, and coasts) being what they are, as such active and forceful shapers of life and land, are key makers of places and memories, or are places where memorable memories form.

This is the ‘ecology of memory’ that Owain has previously written about (Jones 2005) and Heather explores in her work. Living with this *wake* in time of affective becoming as Slaby (2020) puts it, is a key element of personal and wider politics. Places are always in tension between stability, known form and change. Where places are destroyed, and/or people move on, or are displaced, ruptures in their ecology of memory occurs (Jones 2015). In the current era of environmental trauma, the displacement of peoples is increasingly common, yet further ruptures become a staple

of the modernity. It is something to care for place, and to care for places, and lost places through memory. It is something again to share these processes, to begin to care for each other's places, each other's ecologies of memories each other's remembered places. Perhaps that is a key part of caring for the earth as an ecology of places again.

A river is, in a way, an articulation of memory. Water runs, it affects where it runs, thus it remembers where it runs, and follows and follows and follows, and a channel forms. The mature river course is a memory of the first stream that begat it. Of course, like historic maps of the shifting meanders of the Mississippi show, the channels do not stay in the same place, they creep and flex over time (Simmon 2011), as memory itself does.

Jenny Uglow (2006) makes the same point about a river, and memory and history in her biography of the famous engraver of nature and English rural scenes, Thomas Bewick. Uglow starts her account of his life with an entanglement of history of the River Tyne and Bewick's childhood on its banks, seeing this as the source of his life and his art.

The Tyne has changed often since Thomas Bewick was born here two hundred and fifty years ago. Swollen by floods, checked by salmon weirs, hemmed in by railway embankments, it has swung from side to side of its deep valley, cutting under wooded banks, baring strands of pebbles, tangles of roots and ridges of sand, creating smooth tables lush with grass where once the current ran swift. Across the years the river has flowed on [...] We can trace its old path like an individual life, from documents, maps and prints, signs and crosses, relics on the shore [...] – evidence and guesswork. (3)

Interestingly in this context, we turn to the work of Jan Slaby who sets out to construct an understanding of affective becoming in which the past is foregrounded, and a watery metaphor of the past in the present is constructed—the wake.

“I outline the contours of a temporal account of affectivity that foregrounds the past. Subsequently I relate this outlook to Christina Sharpe's powerful conceptual metaphor ‘the Wake’, suggesting that this is not historicity as such but a particular ongoing history of violent appropriation, oppression and displacement that keeps setting the tone for affective being-in-the-world in this day and age (Slaby 2020, 173)

The Wake, he sums up, is ‘the weighty path that historical events draw through time’.

It is important for us to point out that other artists have also worked in relation to the rivers and landscapes in question, both in collaborations with the authors and separately. This again speaking of efforts of polyvocality about these places. Owain has collaborated with the artist Louisa Fairclough on the paper *Sounding Grief*, and the artist Davina Kirkpatrick about dealing with loss and the estuary as a setting for that (Jones and Fairclough 2015).

Recently, the Newnham based artist Carolyn Black has made a short art film of the Severn Bore in the 2020 COVID pandemic UK lockdown. Normally, any big bore (at the highest tides) would be accompanied by surfers, people in kayaks and dinghies. But in the lockdown, the bore progressed with no water riders, and Carolyn filmed the river from the shore as an expression of love the living waters. (<https://vimeo.com/438829349>). Many other artists and writers have been drawn to the river, the Severn Bore, and the ceaseless ebb and flow of the tides. Poets too, both past a present. The Gloucestershire First World War poet Ivor Gurney, who spent the final years of his life in a mental asylum after the traumas of the war, wrote a series of poems called *Severn*

and *Somme*, some poems remembering his times on the tidal river. More recently, Alice Oswald wrote an extended poem, *Sleepwalk on the Severn* (see Bristow 2015) and Philip Gross's collection of poems, *The Water Table*, won the prestigious T.S. Elliot poetry prize in 2009. This was based upon a series of visits to, and road trips over the Estuary where, perhaps, the river does end and sea begins, The Second Severn Crossing.

As most of Bahía Adair is remote, but a few artists have focused on it, including Tucson based poet Katherine Larson who describes the complex ecological and cultural landscape of the Upper Gulf in a suite of lyric poems, *Ghost Nets*, published in her book *Radial Symmetry* (2011) that were originally part of a larger collaboration with Green in *The Ghost Net Project* (2009).

Every day, it happens like this.
We emerge from the pale nets of sleep like ghost shrimp
in the estuaries—
The brain humming its electric language.
Touching something in a state of becoming.
—Ghost Nets, VII

The bi-national organization N-Gen: Next Generation Sonoran Desert Researchers recently solicited six collaborations in a project called *6&6: Six Artists/ Six Scientists*. Four of the six collaborations focused on the Gulf of California, and two exclusively in Bahía Adair (Green/Edwards' project *Isle of Sauromalus* examines a sequestered population of chuckwallas in Bahía La Cholla, and Johnson/Wilder's project *Hidden Water: Pozos of the Gran Desierto* explores the ancient fresh water of the pozos, 2019). So as in the Severn, here artists and writers seek to speak for the rivers and the watery landscapes that are often ignored, hidden, dismissed, degraded, disrupted, damned.

(6) Tidal Timespace

Our collaborative project, *Tidal Timespace: Imprints & Palimpsests* examines, contrasts, and celebrates the ecology and culture of these two diverse river/estuarine landscapes. It is a project steeped in the specificity of place and embedded in the practice of deep mapping, intertwining ecological and historical narratives, personal and communal memory, scientific data, and a wide range of media into a rich, multi-vocal installation. McLucas (2010) describes that deep mapping 'brings together the amateur and the professional, the artist and the scientist, the official and the unofficial, the national and the local'. The use of deep mapping as an aesthetic and methodological instrument democratizes knowledge by weaving temporal, spatial, and disciplinary threads into one practice. (Springett 2015)

Tidal Timespace is cultivated in collaboration and is shaped and performed in the field. Images and ideas string together in walking, listening, tracing, conversing, reflecting, and collecting. As Les Roberts (2016) states, "The 'map' is lodged in the more immaterial spaces of the body and imagination. Its performativity is made flesh in the way the walker inhabits and dwells within the space that both map and walker conjure into being." Timing our fieldwork on the flats during low tide we submit to chance encounters and discoveries, to weather, and to spaces of silence and conversation.

The finished installation will consist of a series of plaster casts of mud and sand flat textures from each site displayed on pedestals, an ambient soundscape created from artistic interpretations of tidal data, and an artist book consisting of a lexicon listing historical details, scientific phenomena, colloquial names, species, and site-specific culture and vocabulary in both English and Welsh for the Severn Estuary, and English and Spanish for Bahía Adair.

Interspersed among the lexicon entries are our childhood memory fragments you see here in the margins of this paper. Memory's details undulate and shimmer, revealed or lost in opacity, only to perhaps emerge again. Through these fragments we endeavor to remember our lost tidal landscapes. In the early 1990's, 80% of Estero La Cholla was destroyed to build a golf course and housing development, and in the 1980s the salt marsh flats called The Lamby, where the mouth of the river Rhymney joins the Severn estuary was taken by Cardiff City council for the site of a large landfill facility to process and dispose of the city's waste. As such these fragments exist as a kind of watery recasting of places and of people that are no longer with us. *Tidal Timespace* will essentially create a kind of time capsule—a snapshot between tides that preserves personal, ecological and cultural heritage, even in the face of possible new developments and altered landscapes. 'Untold land is unknown land,' states Lucy Lippard (1997), 'naming is the way we image (and imagine) communal history and identity'.

Just as the plaster mudflat casts capture ephemeral patterns, scripts and traces between tides, these memories exist as registers, moments that have imprinted on the fabric of who we are. The textures in the flats reflect the patterns of tidal rhythms and flows of water, and lay ground for what will be erased and soon rewritten. The mudflat casts capture this tidal rhythm as a palimpsest. As Jones states (2011: 2287)

Rhythm is to time what pattern is to space, and these need to be considered together. Tidal processes offer fertile ground on which to explore such ideas as they are so obviously temporal and spatial at once.

We are drawn to sound because the places in question are extraordinary soundscapes as well as being visually, ecologically and culturally dynamic. And of course, one can be immersed in air, and in sounds, and sounds of water, as well as in water itself. As Foley states 'The idea of immersion draws on phenomenological concerns, updated within NRT, with person-place interactions and the specific relations between bodies, practices and multi-sensual environments, where surround-sounds, touch, and proprioception have explicitly embodied dimensions' (Foley 2015: 2018-19).

There is a musicality to this immersive becoming; the world as waterscape, as soundscape, or perhaps a series or ecology of soundscapes. Serres begins *Biogea*, his raging lament for the destruction of the earth and its waters, with two quotes. The second (quoting George Bernanos) containing these words; 'for forests, hills, fire and water alone have voices, speak a language. We've lost the secret of it ... The voice that we no longer understand is still friendly, fraternal. A maker of serene peace.' (2012: preface).

By reflecting upon the Severn and Bahía Adair side-by-side, we hope the finished installation can instill a sense of attention, appreciation as well as a feeling of communal care through articulating the specificity of their shared characteristics and their striking distinctions. Just as the tide creates an interchange between water and land, and salt and fresh water—there is also an intercultural

mixing and exchange that occurs—resulting in fertile ground for greater awareness, conservation, and stewardship of these important environments and other tidal river-y places.

Figure 1. The casts made by Heather of the sand ripples in Bahía Adair

(7) Conclusions.

In this account of our relatively new, and ongoing collaboration which sprang out of a realization that we shared similar interests, loves and concerns for two river / tidal landscapes, we have tried to creatively capture our sharing across continents; sharing memories of lost and remaining places, and trying to voice the rivers, tidal channels and tidal flats in question through walking, writing, comparing, making and remembering.

We have sought to deploy what could be termed, overall, a non-representational approach in so far as a *creative* account is needed to bring these physical places to life through various means and practices. These include aspects of autotopographical writing, elements of deep mapping and elements of polyvocality. In contrast to modern approaches of knowledge, which can be summarised as divide, rule, and often, it is sad to say, despoil, we hope our approach offers at least a *potentially* ecological form of knowledge creation which seek to creatively embrace the interconnectivity of all processes, and evolutionary understandings of how the earth and cosmos advance through space-time in a burgeoning, creative becoming of which they, and we, are a collective part. It is for these reasons there is a close affinity between these critical-creative approaches in geography and other subjects and the creative practices of the arts.

As the impacts of modern consumption and globalized capitalism are toxic in nature both on a local and worldwide level—perhaps love is the one strand of ‘true’ ecology that modern humans still have capacity for. Love for place, for community and for each other, and maybe most importantly in ecological terms, love of others’ love. If love is about deep levels of interconnection, inter-becoming, can these stories of shared care of place become part of a wider process of ecological healing?

Acknowledgements.

(In anticipation!) Thanks to Peter Reason for the introduction to this project. Thanks to the editors and those in the special edition group who made comments on early drafts of this paper.

ORCID

Owain Jones <https://orcid.org/0000-0003-4548-8735>

Heather Green <https://orcid.org/0000-0003-2647-0214>

References

- Ball, P. (2017). Water is an active matrix of life for cell and molecular biology. *The Proceedings of the National Academy of Sciences* (PNAS), 19, 2017 114 (51) 13327-13335.
- Barker, N. (2008). *Managing Tidal Change, Final Project Report of Winston Churchill Memorial Trust*. Travelling Fellowship Award 2006. (Published by author).
- Berry, W. (1991). Out of Your Car, Off Your Horse. *The Atlantic*, February, 1991.
- Black, C. (2020). When you call I shall come. (Film, online) Vimeo
<https://vimeo.com/438829349>.
- Bright, R., Irland, B. (2018). Reading the river (interview). *Interalia Magazine; Interconnecting Water*, 44 (September), online at <https://www.interaliamag.org/interviews/basia-irland/> (accessed 2 October 2018).
- Bristow, T. (2015). Bioregional Biography and the Geography of Affect: Spatialised Somnambulance in Alice Oswald's Sleepwalk on the Severn., *Australasian Journal of Ecocriticism and Cultural Ecology*, Vol. 4, 2014/2015.
- Brusca, R., Alvarez-Borrego, S., Hastings, P., Findley, L., (2017). Colorado River flow and biological productivity in the Northern Gulf of California, Mexico. *Earth-Science Reviews*, 164 1–30.
- Casey, E. (1998). *The Fate of Place. A Philosophical History*. Berkley: University of California Press.
- Childs, C. (2000). *The Secret Knowledge of Water*. New York: Back Bay Books.
- Deakin, R. (2007). *Wildwood*. London: Hamish Hamilton.
- Emerson, R.W. (1904). *The Complete Works. 1904.Vol. IV. Representative Men: Seven Lectures VII. Goethe; or, the Writer*. Houghton, Mifflin & CO., 1904, New York: Bartleby.com, 2013
- Flessa, K. and Fürsich, F. (1991). Ecology, Taphonomy, and Paleoecology of Recent and Pleistocene Molluscan Faunas of Bahia La Choya, Northern Gulf of California. *Zitteliana*; 18: 5–180.
- Foley, R. (2015). 'Swimming in Ireland: Immersions in therapeutic blue space'. *Health and Place*, 35, 218–225.
- Green, H. (2009). *Ghost Net Project*. <https://www.heathergreen-art.com/ghost-net-project>.
- Green, H. (2020). *Tidal Timespace*. <https://www.heathergreen-art.com/tidal-timespace>.

- Green, H., Edwards, T. (2019). *Isle of Sauromalus*. <https://www.heathergreen-art.com/6-6-six-artists-six-scientists>.
- Guattari, F. (2000). *The Three Ecologies*. London: Athlone Press.
- Hardisty, J. (2008). *Estuaries: Monitoring and Modeling the Physical System*. Oxford; Blackwell.
- Haslett, S. (2008). *Coastal Systems, Second Edition*. London: Routledge.
- Illich, I. (1985). *H2O and the Waters of Forgetfulness*. Dallas Institute of Humanities & Culture.
- Johnson, B. and Wilder, B. (2019). *Hidden Water: Pozos of the Gran Desierto*. <https://www.benjohnsonart.com/artwork/hidden-water-pozos-of-the-gran-desierto/>
- Jones, O. (2005). An Emotional Ecology of Memory, Self and Landscape. In J. Davidson, L. Bondi and M. Smith (eds.) *Emotional Geographies*, Oxford: Ashgate, pp 205-218.
- Jones, O. (2011). Lunar-solar rhythmpatterns: towards the material cultures of tides. *Environment and Planning A*, 43, 2285-2303.
- Jones, O. (2015). “Not promising a landfall...”. An autotopographical account of loss of place, memory and landscape. *Journal of Environmental Humanities*, 6, pp 1-27.
- Larson, K. (2011). *Radial Symmetry*. New Haven & London: Yale University Press.
- Lavin, M.F., Godínez, V.M., Alvarez, L.G., (1998). Inverse-estuarine Features of the Upper Gulf of California. *Estuarine, Coastal and Shelf Science*, 47, 769-795, Article No. ec980387.
- Lefebvre, H. (2004). *Rhythmanalysis: space, time and everyday life*/ 8/. London: Continuum Books.
- Lippard, L. (1997). *The Lure of the Local: Senses of Place in a Multicentered Society*. New York: The New Press, pp 46.
- Lovelock, J. (2000). *The Ages of Gaia: A Biography of Our Living Earth*. Oxford: Oxford University Press.
- McLucas, C. (2010), There are ten things that I can say about these deep maps, <http://metamedia.stanford.edu/~mshanks/projects/deep-mapping.html>. Accessed 28 March 2010.
- Nabhan, G.P., Hodgson, W. and Fellows, F. (1989). A Meager Living on Lava and Sand? Hia Ced O’odham Food Resources and Habitat Diversity in Oral and Documentary Histories. *Journal of the Southwest*, Winter 1989; 31:4, 508-533.
- Nalini Mozaria Luna, H. (2008). *Humedales de Bahía Adair*, Ficha Informativa de los Humedales de Ramsar (FIR). Versión 2006-2008. http://www.ramsar.org/ris/key_ris_index.htm

- Neimanis, A. (2017). *Bodies of Water; Posthuman Feminist Phenomenology*, London: Bloomsbury.
- Serres, M. (2012). *Biogea*. Minneapolis: Univocal.
- Sharpe, C. (2015). *In the Wake. On Blackness and Being*. Durham, NC, Duke University Press.
- Simmon, R. (2011). Map of the Ancient Mississippi. *Earth Observatory*: (on line).
<https://earthobservatory.nasa.gov/blogs/elegantfigures/2011/05/11/map-of-the-ancient-mississippi/>.
- Slaby, J. (2020). The Weight of History: From Heidegger to Afro-Pessimism. In: L. Guidi, & T. Rentsch (eds.). *Phenomenology as Performative Exercise* (pp. 173-195). New York & Leiden: Brill.
- Smith, N. (2002). *Amazon Sweet Sea: Land, Life, and Water at the River's Mouth*. Austin: University of Texas Press.
- Springett, S. (2015). Going Deeper or Flatter: Connecting Deep Mapping, Flat Ontologies and the Democratizing of Knowledge. *Humanities* 2015, 4, 623-636; doi:10.3390/h4040623
- Thrift, N. (2008). *Non-representational Theory: Space, Politics, Affect*. London: Routledge.
- Uglow, J. (2006). *Nature's Engraver. A Life of Thomas Bewick*. London: London.
- Welland, M. (2009). *Sand. A Journey Through Science and Imagination*.+*/ Oxford: Oxford University Press.