Placemarks on Watermarks:
Mapping, Sensing and Sampling the "Rivers of Emotion"

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Maps are a key discourse for conveying geographical information, yet many cartographic approaches struggle to represent the subjective aspects of a landscape or "sense of place." This paper examines the challenges in mapping emotional engagements with place, considering various cartographic approaches to representing emotions, and how these are complicated by theoretical approaches to conceptualizing place. Where place is theorized as fluid, dynamic, and contingent, we see a mismatch with the logics of cartographic practice and interface design. Participatory digital spatial media offer new possibilities for mapping emotional engagement by overcoming some of these complications. They are thus the focus of the case study of the Rivers of Emotion digital database of emotional engagements with Derbarl Yerrigan and Djarlgarro Beelier (the Swan and Canning Rivers), in Western Australia. The paper reviews emotional responses to the rivers and explores the collation of individual emotional engagements with these places in an online map and database. It concludes with a discussion of possibilities and limitations for mapping emotions and suggests how projects like this can inform collective imagined geographies.

KEYWORDS: mapping; emotion; place; critical cartography; digital spatial media

INTRODUCTION

IN THIS PAPER I EXPLORE how we can study and map emotional engagements between people and place. Places are tricky things to capture or define. They keep changing, our perceptions combining and re-combining with shifting connections. Poststructuralist geographers understand place as ontogenetic, continually mutable in a reflexive process through the thinking and unthinking presence of people within them. Rejecting the concept of an essential definition of place, my focus is instead on examining the practices and processes that contribute to spatial identity, "the constellation of relations," as Doreen Massey (1991, 28) put it, that work together to create place.

The ontogenetic and contingent nature of place presents a particular challenge to cartography. Traditional mapping conventions have been developed to take a static account, representing one author's or institution's perspective, in which data uncertainty is rarely indicated. Dynamic and subjective aspects are harder to visualize with conventional

mapping techniques. Writing on the mapping of emotions, Caquard and Cartwright (2014, 103) note that

> the cartography of emotions remains a major challenge due to the dehumanizing character of maps, at least in their conventional form. The map is a rationalized representation of place that is rather limited for conveying emotions.

If we are to use maps as an interface for collating and conveying information about emotional aspects of place, we also need to ask what the format of the map brings with it: the legacy of cartographic authority and limitations in the expression of emotions in cartographic practices.

Digital spatial media or "geospatial technologies" seem to offer new capabilities for collating and curating different forms of emotional expression (Griffin and McQuoid 2012). Digital mapping is flexible, dynamic, interactive,

and has the ability to integrate different media. Oral histories, images, and audio-visual recordings might all be collated within the same spatially referenced database. Coupled with a web interface, databases can be designed for the input of data from public users engaging in participatory and collaborative projects. Georeferenced information can be filtered, and changes demonstrated over time. Does digital cartography, then, provide effective ways of mapping emotional engagements with place?

This paper is structured in two parts. In the first part I consider the complexity of the task of defining and mapping emotional engagements with places. Following a brief review of key elements in the contemporary theorizing of place, I discuss how cartographers have approached mapping emotional and subjective engagement with place.

In the second part, I turn to the Rivers of Emotion project as a case study. The Rivers of Emotion project is an empirical study of emotional engagements with a particular riverscape, Derbarl Yerrigan and Djarlgarro Beelier—also named the Swan and Canning Rivers—in Western Australia. The project collated and presented emotional responses to the rivers and invited project participants to reflect on the combination of practices, powers, and actors that make place. By exploring these emotional responses through the lens of "sense of place," I consider how individual stories about being by, in, or on the rivers contribute to the identity of the place. Furthermore I discuss the project's use of digital spatial media. I examine what the digital enables as well as ways in which the revelation of emotional engagements might be constrained in a digital form.

THEORETICAL APPROACHES TO EMOTIONAL ENGAGEMENTS WITH PLACE

IN ORDER TO PRODUCE maps that convey a "sense of place" or subjective engagement with landscape, we need to be able to define and represent what is to be mapped. From this basic position of data collection, it is evident that theoretical approaches to defining a "sense of place" or even simply "place" can create challenges for cartographic practice. The various approaches to place and the theories influencing them have been well chronicled and summarized (Agnew 1987; Seamon 2000; Cresswell 2004; Kuhlenbeck 2010; Relph 2015). Allan Pred defines place as "a center of meanings, intentions, or felt values; a focus of emotional or sentimental attachment; a locality of felt significance" (1983, 46). In 1974, Yi-Fu Tuan developed the idea of "topophilia," a love of place: affective bonds with landscapes shaped by aesthetics and cultural conditioning. In the decade following, cultural geographers worked on revealing the power relations within these cultural conditions, with scholars such as David Harvey drawing on Marxist theory to critique hegemonic constructions of place and motivations for the appropriation of place-based traditions (1989, 303–304). This theoretical work has supported critical examination of the construction of place in a range of applied contexts, including urban geography, tourism studies, and heritage discourse.

Today, geographers draw on humanist, neo-Marxist, feminist, and performative approaches to understand spatial identities. Within a dynamic concept of place, as Doreen Massey (1991) promoted in her "global sense of place," we understand that all places are contingent, constantly made and remade by their fluid interactions. Tim Cresswell summarizes this well:

> Whatever kinds of places are constructed they are never truly finished and always open to question and transformation. . . . places are not fixed, bounded and unchanging things but open and constructed by the people, ideas and things that pass in and out of them. (2008, 137)

As I explore through this article, place is contingent, dynamic, and fluid (both metaphorically and here in the real, wet waters of the rivers case study). Edward Casey's (1996) work describes how a place may gather meanings, and through lived engagement with place these can be re-worked, developed, appropriated, and forgotten. Identifying and following common refrains through descriptions of place (Campbell 2016, 199), we see how stories build upon and relate to each other.

Through empirical study of sense of place it is possible to examine how conceptualizations of a place shift and change. With the movement of the spatial turn through the humanities, a range of methodological approaches have been used to study emotions and place. In their book *Place Attachment*, Lynne Manzo and Patrick Devine-Wright (2014) include discussions on narratives, photo-based analysis, social psychology, located storytelling,

quantitative techniques, qualitative interviews, and participatory research as methods for researching place attachment. Several of these methods are relevant here. In the same volume, Clare Rishbeth (2014, 100) demonstrates how storytelling can reveal attachments to place, with "each story an intersection of site, time and human experience." While in Rishbeth's research, stories are prompted through the research process, Neil Campbell (2016), working on "Affective Critical Regionality," offers a theoretical framework whereby literature, film, and art are primary sources for exploring emotional dimensions of place or region. A place-assemblage combines stories of the past and the present, official published accounts and personal reflections, crafted artistic works, and passing musings.

Giuliana Bruno's *Atlas of Emotions* (2002) is a rich example of this, bringing together spatial accounts from film, architecture, and landscape design to explore the dynamics of place. Bristow and Pearce have also recently curated a collection of "essays, creative writing, and sketches of locales and localized affect" though which, they consider space is allowed to "map itself, disclose itself, inhabit its own presencing" (2016, 2). These are all textual means of sharing experience of place, but what about cartography—that key discourse for imparting spatial information? In what ways can emotional engagements be collected and curated? How have emotional engagements with place been represented in maps?

MAPPING EMOTIONAL ENGAGEMENTS WITH PLACE

Several authors have explored the complications of mapping emotions (Kwan 2007; Pearce 2008; Wood 2010; Tuan 2011; Griffin and McQuoid 2012; Caquard and Cartwright 2014). Tuan (2011) nominates emotions, alongside time and morality, as a major discordance between cartography and humanism. He asserts that, in order to create an objective overview of space, cartographers have chosen not to represent subjectivities in the maps they make. Yet, as critical cartographers have worked to reveal, there are many subjective aspects of cartographic practice. Mei-Po Kwan makes the case for an ethical approach that "not only involves reintroducing long-lost subjectivities of the researcher, the researched, and those affected by GT [Geospatial Technologies] back to geospatial practices, but also involves making emotions, feelings, values, and ethics an integral aspect of geospatial practices" (2007, 23). Here I consider three ways in which we might consider emotion as bearing upon contemporary cartography: first, in terms of emotions influencing methodology; second, in the choice of data and data collection methods; and third, in considering the emotional and affective aspects of map design and use.

Addressing the first of these, we can reflect on how emotions stimulate cartographic practice. If a map is a "utopia" as Yi-Fu Tuan (1999) has suggested, it carries an emotional message about how the cartographer wishes things to be. The parallel arguments that a map is a "proposition" (Krygier and Wood 2009; Wood 2010), a "manifesto" (Harley 1991), or even the "conceiving of spatial relationships in the milieu" (Robinson and Petchenik 1976)

all suggest subjective and emotional aspects of mapping practices that propel a cartographer to represent place in a particular way. Yet while emotional force may fuel the argument, the discursive grammar of cartography does not readily facilitate a map with visually decipherable emotions. Margaret Pearce (2008, 17) questions whether cartography is "capable of depicting spaces shaped by experience" and discusses how "western cartography is characterized by specific assumptions and structures, and those structures carry limitations." Her paper is nonetheless optimistic about the capacity of cartography to embrace new techniques and promotes the use of narrative as a means of incorporating emotional engagement with place into her maps.

Scholars have experimented with various ways of sourcing data that record emotions, feelings, and subjectivities. Some cartographic techniques seek to tap an affective engagement with place, such as those that draw on psychogeography to record the whims of drifting exploration, or techniques like mental mapping (Gould and White 1993), which use memories of place as a data source. Qualitative GIS practitioners have experimented with the integration of subjective opinions and ratings as datasets within a GIS interface (e.g., Mennis, Mason, and Cao 2013). Quantitative approaches include Christian Nold's Greenwich Emotion Map (**emotionmap.net**; see also other examples at **biomapping.net**), which uses a combination of bio-monitoring and GPS technology to track and measure emotional responses in different locations. His maps draw new contours on the landscape as participants' biophysical

responses measure how they emotionally respond in different places. Looking at the maps, we can identify locations that have inspired a heightened corporeal emotional response.

Analysis of social media feeds, such as a study of photographs uploaded to Flickr (Purves, Edwardes, and Wood 2011) is another potential method for collecting experiences at particular locations. Indeed, given both the subjective and public nature of much social media data, there is scope for revealing much about the way people relate to place. The potentials of datafication have, however, been effectively critiqued by van Dijck, who writes:

> Social media platforms concomitantly *measure*, *manipulate*, and monetize online human behavior. Even though metadata culled from social media platforms are believed to reflect human behavior-as-it-is, the algorithms employed by Google, Twitter and other sites are intrinsically selective and manipulative; both users and owners can game the platform. (van Dijck 2014, 200)

So use of this kind of data requires a critical understanding of both social media participant behaviour and the role of the institutions that collect, interpret, and share data.

Participatory mapping is a further technique used to gather data about emotional engagements with place (Rishbeth 2014), and collectively produced maps are used as means to present subjective geographic information. Coupled with a web interface, mapping databases can be designed for the input of data from members of the public as participatory and collaborative projects. There has been extensive discussion in the cartography literature on the opportunities and drawbacks of using volunteered geographic information in cartography, with questions of data quality, consistency, the number and variety of participants, and capacity to contribute all being factors that shape the data collected (e.g., Sieber and Haklay 2015). Several prominent examples that "crowdsource" qualitative spatial data include: *The mappiness*, an interactive app and map of happiness (mappiness.org.uk); *Wikimapia*, a crowd-sourced map of the world that encourages the inclusion of subjective comment (wikimapia.org; Bittner 2017); a range of projects that showcase local and oral histories (for example, edmontonpipelines.org; invisiblecities.com.au); and various maps created with the *Ushahidi crowdmap* software

that reveal sites where people have been harassed, feel unsafe, or are in danger (such as *HarrassMap* or other crisis mapping examples; see Kwan 2007 and Pearce 2014, 20, for a more detailed typology of these). In each of these projects, the audience is provided with a conventional map similar to those used for navigation. Often Google Maps or OpenStreetMap are the base maps upon which records of emotional engagement appear as point data (or, within *Wikimapia*, polygons). Clicking on a point reveals information about emotions, yet the points might just as well relate to rainfall records or the location of post boxes. A metadata record of emotional information stored in a database does not affect the look of the map and does not reveal how emotions work to create place. In these maps, conventional cartographic techniques enhance the legibility of the information. Nevertheless (as I will go on to explore in more detail through the case study), the norms of disciplinary cartography jostle with the expression of emotional and subjective spatial information within the discourse of a map.

Cartographers employ a range of approaches when mapping emotional and subjective information. While some, like Nold, seek to quantify and plot emotions, others play with cartographic design to convey emotion. Pearce's (2008) mapping of journal entries draws on narrative descriptions to color the maps produced. Several anthologies of critical cartography (such as Cosgrove 2008; Dodge et al. 2009; Wood 2010) discuss cartographic art as inspirational in this regard, and that "we ought not to separate the analytical from the creative" (Dodge et al. 2009, 332). Artistic approaches often pay less heed to cartographic norms and use visual effects to express emotions. Stuart Aitken (2009) promotes the possibilities for combining cinema and cartography as a way of incorporating emotional aspects. Lisa Parks' discussion of GPS for mapping the subjective—or "plotting the personal" as she puts it (2001, 212)—demonstrates how mobile or ubiquitous mapping can reveal sites of emotional engagement as "waypoints" experienced through a mobile device, when located in the places referenced.

There is a spectrum of approaches, both in terms of data used and cartographic design. Some represent emotions through quantitative data from bio-monitoring, others use qualitative psychogeographies and narrative response. The design of the mapping interface ranges from conventional to map art. Digital technologies seem to offer a chance to play with both, letting designers mash multiple media

into a map interface, or, through geolocation, move out of maps to deliver geodata in different ways. Before examining the Rivers of Emotion database as an example of how digital methods can facilitate representations of emotional engagements with place, I want to digress briefly and consider the possibilities and implications of working with digital spatial media. Researchers have critiqued the way that the digital offers new interpretive frames through which to engage with place.

PLACE IN THE DIGITAL

THE VIRTUAL EARTH that has been constructed is more than just a collection of digital maps, images and articles that have been uploaded into Web 2.0 cyberspaces; it is instead a fluid and malleable alternate dimension that both influences and is influenced by the physical world. (Graham 2010, 422)

Mark Graham has written extensively on the implications of the digital for theorizing place. With Matthew Zook, he developed the term "digi-place" to refer to the "use of information ranked and mapped in cyberspace to navigate and understand physical places" (Zook and Graham 2007, 466). At the intersection of "software (information) and hard-where (place)," it has helped to describe the relationship between the creation of geo-information in a digital format and lived experience in places. Having followed the evolution of digital representation of place from online atlases through to geo-tagging in augmented reality, Mark Graham's more recent work (Zook, Graham, and Boulton, 2014; Graham 2017) claims that the digital changes the very nature of place, such that the "map is the territory" (2017, 44). In a somewhat circular argument, Graham asserts geographic information had an instability when it was passed orally from person to person, but this information became immutable through the ability to record it in a "container" (i.e., on a map). Yet now, with the advent of digital augmentation, it is attached to places as well as containers:

Instead of just being fixed to containers information can now augment and be tethered to places; it can form parts of the layers or palimpsests of place. A building or a street can now be more than stone, bricks, and glass; it is also constructed of information that hovers over that place: invisible to the naked eye, but accessible with appropriate technological affordances. (Graham 2017, 44)

While I agree that places can be conceptualized as palimpsests with information about them continually recorded, re-recorded, erased, and so forth, it seems that the development of new technological possibilities has tangled up Graham's logic. The technological accessibility of information *in* place does make a practical difference, but the revelation that information now both hovers above and constitutes place is redundant to the people who paint their paths across country, recite prayers along the road to Lhasa, or who cannot help but think of the children's song each time they walk over a bridge in Avignon. The digital nature of spatial information is a different way of encoding this information, but geo-information has long "hovered" over places. Digital encapsulations of place, whether contained in a book, on a screen, or through a placemark, are a partial and temporary fixing of relations; and, as Graham shows in his later discussion of ontogeneity, this information is always in a state of flux regardless of the form of the container. A more pressing question here concerns how the digital recording and presentation of geo-information influences the way people engage with place: how does the digital affect the way people make place and place makes people?

Maja van der Velden (2010, 15) remarks on how information from different cultural contexts such as "indigenous knowledge" is managed in a digital space: "such a database becomes a contact zone for different ways of knowing the world and different ways of making the world." The struggle to classify and contain different forms of information comes to the fore when decisions must be made about cartographic representation or coding within a database. The simple line on a map separating water from land hides all manner of assumptions about geomorphology, cultural constructions of hydro-geography, temporality, and representation. Mark Graham (2017, 53) is not oblivious to these, and suggests they are the subject of critical and radical attention; they constitute "a range of micro-political challenges to the digital status-quo: strategies to inappropriately appropriate platforms, misrepresent,

over-represent, delete, amend, and pervert information." Importantly too, we need to remember the world outside the digital: the contingencies and fluidities of construction, alternative imaginings, as well as the importance of recognizing the partiality and situated nature of any work (on place).

The supposed seamlessness of the flatscreen world can obscure the messiness of crowd-contributed data and the limits of classification and curation. It often promotes the same treatment of data regardless of provenance, quality, or relevance. Information is represented through predetermined interfaces that delimit engagement in certain ways and preclude other types of participation. Scholars working on digital geographies have helped to reveal and critique the power relations inherent within the use of digital spatial technologies (see Zook et al. 2014; Haklay 2013; Elwood and Lesczynski 2013; for the influence of factors such as gender or class, see Stephens 2013; Perkins 2014). Haklay's (2013) call to conduct "deep mapping" suggests an ethic of engagement that enables participants to question and (re)create the terms on which they map, reflecting a broader concern within the digital humanities about access, equity, and control within digital spaces (see Spiro

2012; McPherson 2014). This work has implications for a research method that incorporates digital technologies.

For now, let us turn to the case study of a digital database created to compile emotional engagements with place. Through analysis of how the database works in practice we can examine how some of these complications come to the fore. First, I consider how this project has captured stories and feelings that show attachment to places. As well as overt expressions of emotion in poetry and prose, I examine the way emotional practices are evident in the kinds of interactions people describe having with rivers. I then consider the role of temporality within these records, looking for shifting engagements over time and consider how dynamic engagement is handled by the database. Finally, I reflect more broadly on the capabilities of the digital map and database as a repository, examining the potentials of the digital context as a way of juxtaposing multiple perceptions and representing collective responses. With all the contemporary emphasis on big data and the recording of quantitative statistical information, it is worthwhile to investigate the capacity for emotional and qualitative information to be presented in a cartographic format and the use of digital technologies to explore past and present emotional attachments to place.

SAMPLING FROM THE RIVERS OF EMOTION

The Rivers of Emotion project was developed to record and collate emotions connected with Derbarl Yerrigan (Swan River) and Djarlgarro Beelier (Canning River), which flow through the Western Australian city of Perth (Figure 1). The project was conducted as a collaboration between the University of Western Australia and the National Trust of Western Australia and funded through the Australian Government's Your Community Heritage Program. It was designed to contribute new understandings of the cultural landscape and to provide an opportunity for the community to share their experiences of the rivers. The project delivered a 2012/2013 community snapshot of emotional connections to the riverscape and thus informed a social values audit as part of the Swan River Trust's interpretation plan for riverside heritage trails.

As the joint work of historians and heritage practitioners, the project incorporated several dimensions: archival research; the curation of material in a digital web interface; workshops with school children and participants in the

University of the Third Age ("U3A"); and a public symposium. A small booklet compiling historical material was produced to stimulate wider participation and was distributed to public libraries and schools around the region
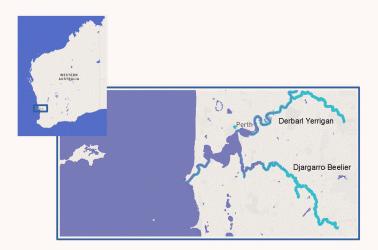

Figure 1. Location of Derbarl Yerrigan and Djarlgarro Beelier—the Swan and Canning Rivers (Author, Mapbox).

(Broomhall and Pickering 2012). The online web interface (shown in Figure 2) offered those who came across the project a means of recording and sharing their emotions. With this online database and map as the catchall and on-going archive for a range of emotional responses, it is the focus of discussion in this article.

The website invited members of the public to explore the records of emotional engagements with the rivers and to participate by adding contributions of their own. The public could make contributions by registering with the site as a member and filling out a series of web forms to submit information about an incident, memory, or special connection. Most entries were geo-tagged and thus linked to specific locations around the rivers. Contributors could also enter information about the date of the event and kinds of emotions felt, and upload supporting material such as videos, artworks, photographs, or sound recordings. Each entry was approved by site administrators and then became visible to members of the public.

People viewing the website could then click into individual accounts associated with points on the map, or find records through a keyword search function. Each entry had an information page displaying the details provided by the contributor. There are two key ways in which these records were sorted or given associations within the database. Primarily, they appeared in the web interface under four categories depending on the format of the contribution:
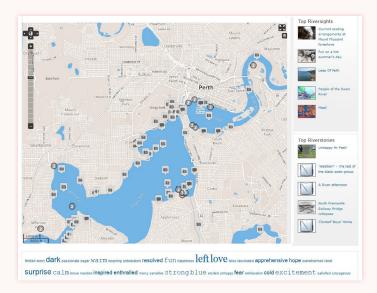

Figure 2. The online web interface was available at riversofemotion.org.au. It can now be accessed through the Wayback Machine at: web.archive.org/web//riversofemotion.org.au.*

"River Scenes" (film), "River Sights" (photographs and visual art), "River Sounds" (audio recordings), and "River Stories" (written texts). Secondly, some of the entries included "tags"—words expressing particular emotions (such as "love" or "fun" or "sad") identified in the source material. These words were included in the website in a word cloud under the map interface (see Figure 2). By clicking on a word in the cloud, all entries tagged with that emotion were displayed on the map; thus, through the map interface, it was possible to identify sites with emotions in common, prompting questions about environments that evoke particular emotions and how stories might build upon each other.

In personal communications with me, the project designers explained that they deliberately chose to use a map as the primary interface so they could identify emotional hotspots where different kinds of intense emotions are linked to certain places around the rivers. Yet they also noted that the requirement to identify a particular point on the map privileges site-based perspectives, rather than reflections on the river as a whole. Another rationale for choosing a map was because the designers considered maps to be a familiar framing of the landscape. They saw a map as something that appeared neutral to different user communities and did not visualize people doing certain activities that would frame expectations of what should be added to the database. The project leaders were nonetheless aware of the problems associated with cartographic discourse and, particularly for this application, that maps often represent a Western viewpoint.

The website used the Drupal Content Management System (CMS): a robust, secure, open-source platform. The map was created with Mapbox (**mapbox.com**) map object layers or "tiles" and configured with customized colors and icons chosen from open-source collections. The website launched on October 24, 2012, and statistics were gathered for the period between October 2012 and June 2013. There were 1,185 unique visitors in 2012 and 19,498 unique visitors in 2013, according to Google Analytics. Visitors returned an average of 2.5 times and viewed an average of 9.21 pages per visit. As is the norm for online participation, the vast majority of visitors were passive viewers rather than active participants contributing their own emotional engagements with the rivers (see Bittner et al. 2016 for a continuum defining participation in crowd-sourced mapping). There were only 158 uploads to the site and 202 records in total.

Contributors were not required to provide details other than their name, email address, and a password when registering on the website. This means it is difficult to determine any common characteristics of contributors. Amongst the registered users who contributed were at least ten individuals and organizations represented at the project symposium. The Rivers of Emotion project encompassed several activities and hence many of the 202 records contain data that were collated as part of the archival research and oral history component of the project. The "author" in these records is often listed as an institution, such as "City of Perth Art Collection," "The Perth Gazette," or "Birtwhistle local history library." A further 10 records were included through interviews with project officers, and contributions gathered through workshops with school children were uploaded as video and image files ("River Scenes" and "River Sights"). Forty-five entries were uploaded by individuals, including personal contributions by those who developed the project. This demonstrates an ethics of "mapping with," where the researchers' own emotional engagements with place were included alongside those of other participants whom they inspired to contribute. Within the dataset, no distinction is made between researcher and research-participant.

Taking theoretical inspiration from the cultural studies and critical theory approaches to place discussed earlier, I first consider how the collection and mapping of emotional encounters in this way reveals spatial identities of Derbal Yerrigan and Djarlgarro Beelier. As well as explicit descriptions of landscape, the accounts implicitly relate emotional practices that produce connections to sites and describe how various emotions are performed at the rivers. I then go on to discuss challenges in conveying sense of place through the medium of a website and map. I conclude with a discussion of the limitations and opportunities provided by this kind of project.

EXPRESSING EMOTIONS ABOUT PLACE — "LOVELY BEYOND DESCRIPTION"

EMOTIONS, FIRST AND FOREMOST, are revealed in how people recount their experiences of a landscape. For example, upon arriving in 1829, a traveler on HMS *Sulphur* noted: "The Swan River would require the language of a poet to describe it. The scenery on its banks is lovely beyond description; its course is beautifully serpentine" (bit.ly/2FPmVe8).[1] The river is "lovely" and "beautiful," so the author is presumably pleased by it. Beneath (or perhaps "beyond") this description is the act of emotional engagement. Written texts like this are a demonstration not of the moment of sensing, but a mediated emotional response. They depend on the capacity of writers to convey how the rivers make them feel. This project is therefore a collation of mediated expressions, a reflection on both the riparian landscapes and those who share their accounts, as well as the research techniques and curatorial decisions made by the project team.

There are broadly two sorts of entries in the Rivers of Emotion database. On the one hand there is user-generated content where contributions were prompted through participation in the project itself. On the other, there is content reproducing historical material collated by the project team and uploaded into the database. These archival entries provide a record of the historical environment, and of historical practices of emotional engagement. They also serve as examples of spontaneous responses to the landscape formulated outside the framing of the Rivers of Emotion project (although included in it through selective curation, of course). One example is W. C. Gilbert's 1827 record in the HMS *Success* expedition notes:

> The scenery was delightful,—the Trees growing to the water's edge,—the transparency of the River,—the Mountains and Plains alternately appearing—and this place only requires a little assistance from Art to render it one of the most delightful spots on earth. (Broomhall and Pickering 2012, 21)

His joy echoes that of James Stirling, Captain of the expedition, who describes the first bend of the Swan River as a "magnificent basin" (Broomhall and Pickering 2012, 21). Stirling's emotive descriptions are articulated with a

1. As the project website is no longer available online, I provide alternative sources at which to view the database contents to which I refer. The database contents can be browsed through the Wayback Machine (web.archive.org/web/20170912200556/http://riversofemotion.org.au). Where entries are not available through the Wayback Machine, references have been provided to the project book authored by Susan Broomhall and Gina Pickering (2012).

wider purpose, not the least because they helped justify his desire to found a colonial settlement along the river. An engraving, copied from a sketch drawn on the same expedition, depicts a comfortable scene of lush grass and tranquil waters drawn in a style such that viewers far away find the landscape sympathetic (bit.ly/2AWAtkG).

This archival material reveals how, in coming to a new landscape, many judgments were made through comparison with other places. One entry refers to the riverscape as within a "topsy-turvy country," a moniker that emphasizes the strangeness of the environment as a departure from familiar landscapes (Broomhall and Pickering 2012, 24), while another likens the mosquito-infested swamps along the Swan to the jungles of Papua New Guinea (bit.ly/2HoqPwP). These descriptions invoke distinct spatial identities or "imagined geographies" to help convey a sense of place.

Returning to the idea of place as palimpsest, naming is another very obvious way in which spatial identities have been both inserted and ignored, erased though colonization, overwritten and re-inscribed. Referring to new places through the re-use of European names (such as Perth or Swanbourne or Dalkeith) has emotional consequences, bringing to these new places a suite of emotions associated with the original locations. Through Nyungar place-naming, too, emotions are inscribed in the landscape. Etymologies such as *Goodinup* (a place of desire of the heart), *Beeabboolup* (a place of abundance), and *Walyaup* (a place of crying) (Bracknell et al. 2015) signify emotions associated with particular sites in the riverscape. The Rivers of Emotion database includes stories and artworks demonstrating indigenous connections to this *budja* (country), and also records the intentional assertion of Nyungar place names, with one entry referring to a speech by politician Alannah MacTiernan in September 2003:

> The naming of the Canning River twin bridges in Langford as "Djarlgarra," the traditional name for the river, was selected after consultation with local Noongar as the "meeting of Aboriginal and European cultures as the general area is where Europeans first chose to settle in 1829." (Broomhall and Pickering 2012, 26)

Names are often very deliberately chosen for the emotional connections they invoke.

Archival records are complemented by accounts generated through the project itself, in workshops, the symposium, and the web-based participation process where contributors were primed to think reflexively about how the rivers make or have made them feel. Researchers took a deliberate decision not to define emotions, but rather to give participants a free-text space to write in their own terms how they think places are emotional (Susan Broomhall, pers. comm.). The intention was for the participants to inform the project team about public perceptions and definitions of emotion. The project philosophy was inspired by the following assertion by Julian Rappaport:

> If narratives are understood as resources, we are able to see that who controls those resources, that is who gives stories social value, is at the heart of a tension between freedom and social control, oppression and liberation, and empowerment versus disenfranchisement. (1995, 805).

Hence the aim of the project was to elicit a wide range of content from diverse groups and not to predetermine what it might look like. The wording on emotions in the book and on the website was deliberately broad, promoting the sharing of stories, memories, experiences, feelings, affections, and emotionscapes.

Researchers did nevertheless observe limits in the ability of respondents to verbalize emotion and therefore included a vocabulary of prompt words to assist this. Contributors could either choose a "tag" from this list or write their own emotion words in if they could not find a term that fit. Although the database was able to encompass expression of emotion in different forms—through sketching, painting, sculpture, photography, video/sound recordings, and text—the capacity for people to convey how they feel is shaped by the form. As I go on to discuss, the ability to re-present these in a digital format is another complicating factor in conveying emotions to users of the database. For example, clay sculptures produced by school children in response to the river could only be included in the digital database as photographs or text descriptions.

EMOTIONS IN RIVER PRACTICES

ANOTHER STRATEGY FOR uncovering emotional engagements with place is through an examination of emotional practices, in the form of the interactions people have had with the rivers (see Scheer 2012 for a detailed discussion of this theoretical approach). Many contributions to the database describe the rivers as a place of recreation. Some record everyday interactions, of coming down to the rivers as calming (see for example these interviews with Orana Catholic Primary School students [bit.ly/2DpJDaM]). Others talk of special times or occasions enjoyed at the rivers. There are childhood memories of family outings (Figure 3).

One childhood memory in the database is a quotation of Nyungar Elder, Irene Stainton, recalling enjoyment and sustenance from the rivers:

> Aunty May used to take us turtle fishing near Guildford Bridge. We used to catch them with a fishing line, using small pieces of meat for bait. Aunty May would wring their necks and we would take them back to her house where she would cook them in the oven, placed on their backs. I remember the meat being quite juicy and we would dip our warm damper in to soak up the juice. (bit.ly/2S10MQi)

Learning to swim, paddling, and fishing: these are bodily, affective experiences, conveying the physical presence of the storytellers in the landscape and familiar practices associated with place. The also tell us about practices that pass on emotional attachment, extending these from individual experiences into a collective way of identifying sense of place.

Indeed, reading multiple entries we can begin to see how stories work together to create larger narratives of the role of the rivers in people's lives. It is possible to identify tropes—such as, for example, the number of contributions demonstrating the fine line between fun and fear, particularly in on-water adventures:

> Often our course took us down towards the mouth of the river towards Point Walter and then turn around a marker called "suicide." Yes, we did get knocked down jibing around the marker. As I was working the main, I finished up being the only one of five left on board. We finally righted ourselves and sailed in a very wet fashion back to the finish line. No trophy that day. (bit.ly/2U4xopH)

The rivers have sad histories of tragic deaths and suicide, with this element of the rivers discussed and painted by Jo Darbyshire through several separate entries (bit.ly/2REGInr; bit.ly/2FGnPKm). Another database record depicts a marble monument remembering children who drowned in a boating accident. The emotive act of establishing a memorial on the rivers continually presents the event over time, and the recording of the memorial in the database recognizes not only the emotions attached to the accident, but the process of reinscribing emotional engagement that occurs as people visiting the rivers today interact with the memorial. Yet, perversely, while tragedies can loom large in the collective imagination associated with places, here they are another entry in a database, accorded the same treatment as a passing whim. This is but one way in which the collection of stories in the database is at odds with how stories come together in our memories to create a sense of place.

Another aspect of place difficult to compress into a soundbite or map

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Fun on a hot summer's day

Nothing could be more fun on a hot summer's day, than for the Mums of the street to organize a picnic on the river's edge! We all packed into the couple of old cars & drove to our favourite Peppermint Grove, at the foot of Johnston Street, where the cool trees shaded the grassed verge close to sand & the lapping river. Exploring, we paddled, under watchful parental eyes, finding shells, jellyfish, blowies and driftwood. We sailed our homemade war ships, all grey & black, that had been lovingly fashioned by our handymen Dads.

Author: Margaret McLean
Date: 1940s
Tags: fun lovingly watchful

Figure 3. "Fun on a hot summer's day," Margaret Maclean. (bit.ly/2DoISPw)

entry is the very multiplicity of impressions that coincide when experiencing place. Sitting by the rivers, there are very many shifting things that can impress: the sound of water lapping, mingling with traffic in the background, bird calls, light playing, and a cacophony of thoughts and recollections. One of the poetic contributions to the database by Nandi Chinna entitled "Derbarl Yerrigan" reproduces this layering of stories, described here as "misunderstandings":

> There are so many misunderstandings about a
>   river:
>
> [...]
>
> Is it a mixing of sweet water with salt,
> turning back upon itself, mingling interior and
>   exterior
> estuary nibbling at river, river haemorrhaging
> into the widening space?
>
> Is it the flick of a serpents tail,
> or the wake left behind as its rippling skin
> cuts swathes in limestone hills?
> Or an ancient trail along which people walked
> following tributaries and at each place
> re-telling the story of every drop of water
> that seeps from the ground, high dives from
>   stony ledges
> and cleaves relentlessly westward?
>
> (bit.ly/2DqeYuk)

Chinna's mixing of geomorphological elements with Nyungar connections to *budja* is added to throughout the poem with other impressions from her personal interaction with the river and the citation of both historical and contemporary writers. Chinna's writing is inspired by walking through the landscape and she has published a volume of poetry about places along the Swan River, written on her walks (Chinna 2014). This poem, here a database record, invokes the very sense of mingling stories that flow through the river's identity, and at the same time it is a discourse on the act of reflection as revealing the multiple stories that entwine around a place.

By searching through the database entries by keyword it is possible to construct basic relationships and find common ideas. Several sites tagged as "happy" are where people bathe in or relax by the river. "Dark" is associated with places where the river narrows and refers, the detailed text of the records shows, more to spaces under bridges or where one might be at night rather than the cliffs or dark spaces along the shore. In this way a link can be drawn between individual affective responses and more common imaginings of sites along the river. It requires the aggregation of many stories and would probably be more effective with a larger sample size than the existing entries in the database. A further step that has not been taken here in the design of the database is the possibility of flagging associations between entries as they are read. Within individual records in the database, readers do not see explicit connections with other contributions. Entries are discrete, each an individual response, and it is not possible to easily find out if there are similar stories or whether responses to the same place build upon each other or change over time.

RIVER STORIES THROUGH TIME

By HIGHLIGHTING THE MOTION in e*motion*, Giuliana Bruno suggests that space is mobilized by emotions: "set into motion through the lived connections of being" (Bruno 2002, 410). In the act of sensing, place is activated and "shimmers" through the engagement of actors in place. Reading about or viewing emotional engagements, web visitors might, in a way, be transported to the sites of interaction. However, following journeys or tracing evolution through time is much more complicated in the context of the digital database and cartography project.

The database and map provide a simplistic representation of dynamism. While it is tempting to imagine the project map as an overall scheme of emerging and accumulating stories, each entry on its own has a more complex temporality. Many refer to a series of memories:

> Point Walter is a special spot for my husband and I. It was the location of our first date, our first kiss, where we celebrated our engagement, and then in 2011 where we were married. I

hope in a few months it will also be the first place I take our son. So much love in one location. (bit.ly/2FDx6Tz)

Like many others, Melissa Kirkham's entry above is about the inscription and re-inscription of the same site through a continuing connection, even imagined into the future. Time crumples together, too, in Albert Corunna's explanation of how "camping sites, places of birth, and burial sites are significant in our [Nyungar] connection to country" (Broomhall and Pickering 2012, 26). Multiple temporalities are thus combined through the compilation of an entry in the online platform, and given a new, single time-stamp. Re-*present*ing the past through the digital, the database contains data recorded over a time frame of several hundred years and extending further in relation to indigenous occupation. The representation of this is therefore necessarily more complex than a timescale slider and markers appearing or disappearing from the map.

Caquard and Cartwright emphasize sequencing as another important aspect of temporality within cartography, writing:

> The simple location of the events alone is not sufficient to grasp the meaning associated with place. The sequencing of those events is a major element to make sense of their full spatial meaning. . . . in order to be mapped stories have to be envisioned as integrations of space and time; as spatio-temporal events. (2014, 102).

Although contributors are asked to provide a date relating to their entry, the Rivers of Emotion map interface did not allow for the sequencing of stories/images/sounds. Website visitors thus missed out on the opportunity to read stories in temporal context. As Margaret Wickens Pearce's case study of canoe voyageur John Macdonnell in

Canada demonstrates, innovative cartographic work would have been required to represent narratives of movement through space. Pearce used color hues to denote different moods and emotional responses along Macdonnell's river journey, creating "affective geographies in the map by fostering performativity and intimacy and encoding for the movement of emotions in the landscape" (Pearce 2008, 30 and Figures 4–8).

The use of novel techniques such as the integration of moving icons or color coding could help readers to understand the complex interplay of spatial, temporal, and emotional elements. There are many possibilities here for visual interfaces to include complex and cinematic components. The clay figures of school children could be 3-D scanned and rise out of the mud of the river at relevant places. There is the capacity to meld stories into one another, showing how a place transitions through time. Or, animated lines could follow narrative journeys and trace movement through the landscape, perhaps incorporating mash-ups with video from GoPro cameras that follows a user's visual experience through place (for critical discussion of animated maps, see Mapbox 2013 and Wilson 2017). One might take inspiration from Lisa Parks, who writes:

> By inscribing the materiality of human movement onto the discourse of cartography, the GPS map brings global positioning and social positionality together. And in blending the stories of location with digital cartography, plotting the personal transforms maps into situated "world-views." (Parks 2001, 217)

In this vein, we might even find ways of flicking between different participant perspectives to represent the multiple authorship or the varying positionality of map contributors.

REFLECTIONS

The more complex a representation, the more tempting it is to become drawn into the cartographic logic of encapsulation and order. The overview of the map prompts us to consider the database as analogous to the way information comes together (and moves apart) in the construction of spatial identities, as a digital form of Casey's (1996) gathering. But the map is not the territory, and the database is

not the imagined geography. Like Haraway's (1991, 189) "God trick," or Nagel's (1986) "view from nowhere," the database, and indeed the map, seem to bring all these impressions together, suggesting that we understand an objective overview of the situation. The database, recording traces of the way people have experienced particular sites along the rivers, is a bit like a kind of multi-dimensional

digital photographing of ideas coming together and co-alescing to form a sense of place. But, like a photograph, the database is not all-encompassing and its technology, authoring, and temporality need to be questioned.

Many aspects of the map are obscured from view, and without an account of the map's curation, we are not able to see the processes of selection underlying this representation of place. The database is a partial view, combining particular kinds of responses. Kitchin, Gleeson, and Dodge (2013) employed narrative reflection to write about "unfolding" and revealing mapping praxis. While a revelation of project genealogy cannot hope to consider all possibilities, it does help readers to understand the contingencies by which decisions have been made, providing critical metadata on the map's content. Analysis should include both what the project entailed as well as considering what might have been. It also requires looking at the agency of those not necessarily credited with a voice, including non-human agents such as the river itself (see Smith 2017 for a detailed discussion of the agency of rivers). While a full-length narrative analysis is outside the scope of this article, research for this paper included retracing the decisions made in designing the project and compiling the database, website, and map. Critical examination included analysis of factors such as those identified by Mark Graham (2017): participation, access, control, and representation, and I address each briefly here.

Reflecting on the process of digital participation in the Rivers of Emotion project, there are several ways in which both the contribution of information and accessibility are limited. The project had a short time span tied to the funding available to keep the website active. It was taken offline in late 2017. The project has also been affected by the limited number of people who knew of it and were inspired to contribute, despite efforts to promote it through outreach in schools, the symposium, and publication of a book. Additionally, individuals wishing to contribute required access to the internet, an email account, and sufficient computer literacy to complete web forms (and in some cases to upload documents). The project team proactively sought to address accessibility issues by working with both children and older people who might not be able to access the interface of their own accord. These people, and those whose words or works are within archival material, could not, however, determine how their engagements with place were represented.

Power over these contributions is exerted through the network of software, institutions, and discourses that hold the map together. Even the contributors who authored and submitted their own emotional experiences are bound by the protocols of the database for submitting information and how it appears in the context of the map. Given the project is a public website, it excludes emotional engagements that people prefer to keep private. While authors could choose a pseudonym, they did have to provide a valid email address. Once a contribution had been made, the author was not able to control any settings that might determine who could read it or how the contribution appears online. Once shared, the report was unable to be edited. The curators could in principle exclude or alter content—although this was not ever considered necessary. As it is, the curators exercise power in re-presenting these stories, sounds, and images in the context of the Rivers of Emotion database. The context in which a story is heard or an image seen affects how it is interpreted. In particular, taking these experiences out of the landscape and into a secondary medium changes their affective power. We are no longer in place, surrounded by the same physical impetus. On the other hand, the entries gain new meaning through their juxtaposition with other contributions, from different people, with different responses at different times. The website user can choose the path they take through this online catalog: sorting, filtering, and determining the method by which they enter into and out of database records. They, too, have the privilege of a cartographic voyeurism, scrolling around the landscape, able to zoom in on other people's memories. Website visitors did not have to identify themselves or go through any form of security before accessing the content. It is interesting to note that despite the rhetoric defining online users as "produsers" (Bruns 2007) or "prosumers" (Toffler 1980), suggesting an elision of audience and contributor, these two modes of interacting with the database are quite distinct.

The ability to hover over and zoom in and out of the riverscape is just one consequence of choosing a map to present this data collection. Returning to the discussion of cartographic representation, the use of a web map provides, as the designers intended, a familiar entry to the landscape. The information could have been presented through alternative means, such as a book, web discussion forum, film, or museum exhibition. The use of an online map provides access to a widely dispersed audience and allows the incorporation of multimedia elements. It also has the benefit of showing us the areas of the riverscape that do not have

data recorded—the blank spaces on the map. These indicate forgotten places or locations that may have meaning to people who were not involved in the project. Use of a mapping interface also promotes the sorting of multiple records and, with more records and a more sophisticated interface, might have led to deeper understanding of how engagement with the rivers has changed over time.

Moreover, as I noted earlier, the cartographic authority of the map influences the representation of information. The map has a discursive power that appears to provide a comprehensive overview, in a clean manner. As such, it hides the messy and contingent nature of the data. This is unfortunate, as one of the key elements that defines sense of place is contingency. In presenting and reading a map of this nature, it is exactly this contingency that needs to be emphasized. Instead of a comprehensive definition of spatial identity, entries in the database should, I suggest, be considered as recordings of the way people have thought about and relate to place. These are samplings, but not "samples" in a scientific sense. Neither should we assume they are representative of other ideas or places. Assembling them here provides impressions or tastings, rather than any sort of comprehensive attribution of spatial identity. Place is fluid, and these samplings, as moments of realized engagement, are partial, positioned observations of flow. Each recording enables a digital placemark on a shifting, sometimes legible watermark.

However fleeting or ephemeral, there is nonetheless a value in sharing these moments. In the revelation of different perspectives, of conflicting accounts, as well as the compassionate recognition of shared experience, there is capacity to open up the concept of sense of place in order to account for more than individual impressions, taking in the seething collective of imaginings. Larsen and Johnson (2012, 640) suggest that sharing moments of contemplation, "wonder," and "compassion" "opens up an affinity politics [that] lies in the attunement to and understanding of the constant mutability of the world . . . and the compassion intrinsic to grounded social and ecological relationships." Kye Askins (2016, 526) too, suggests that through emotional engagements, including conflict, "it is precisely the emotional that opens up the potential for making connections, and through which nuanced relationships develop, dualisms are destabilized, and meaningful encounters emerge in fragile yet hopeful ways." Cartography certainly can play a role in communicating emotional engagements

and facilitating such exchanges. Indeed, Francaviglia (2005, 188) finds a similar sort of affinity inherent in the spirit of cartography when he writes:

> Mapmaking and exploration may answer questions about the discovery of places that are very remote, but they always involve human emotions that are surprisingly familiar. In the end, all cartography—like all exploration— attempts to conquer the unfamiliar by making it comprehensible.

Maps that reveal these emotional experiences work to increase understanding of and between people, as well as recording geographical knowledge.

The Rivers of Emotion project encouraged a public awareness of emotional connections, revealing stories for wider circulation. Yi-Fu Tuan wrote of attitudes that reflect a governmental logic where

> the words "attachment" and "love" have no place in social science discourse and sound more like poetry than a basis for a serious argument in political and planning councils where hard budgetary decisions are made. (1974, xii)

Yet through projects such as this just the opposite becomes true. As land managers and planners seek to promote the development of recreational spaces or to document the reasons why a place has "intangible value," it is the recognition of emotional engagements that gives power to otherwise opaque processes like "public consultation." Content from the Rivers of Emotion database has informed the Interpretation Plan for the Riverpark (Swan River Trust and National Trust of Australia [Western Australia] 2014), and hence is used as a basis for governmental decision-making and management practice. Emotions direct people to contribute to such consultations and to act to defend places.

In our everyday lives, emotions underlie the desire to spend time in certain places. Places thus become the settings for our memories and stories. Another extension of this research would be to follow place narratives/river stories as they are retold, considering how they circulate. The database is an assemblage combining different sorts of impressions and, when read and recounted, these in turn will

take on new meanings as database users pass them on to others. Much of the information in the database pre-exists its digital encapsulation and it is capable of breaking free from it.

CONCLUSION

HERE I HAVE DISCUSSED the practical and technical limits of cartographic discourse: clay figures, however converted and inserted into a map, will be different from their real, tactile form. In examining maps of emotions, it is evident that there is a tradeoff between the map as a straightforward and legible discourse for navigating the landscape, and the visual appearance of the map in revealing the complexity of places, which we recognize as dynamic, contingent, and multiple. More artistic representations might produce interfaces that inspire empathy and reveal subjectivities in the landscape, or even follow these as they shift. In the Rivers of Emotion case study, the map is an ordering device rather than a visual representation of emotional engagements. Clicking through a point on a map, we are led to artworks, films, and stories that help us understand more about these riverscapes. There is scope for future research about the affective power of different map designs and their capacity to impart particular sensations or facilitate shared experience. What sorts of cartographies promote compassionate recognition? Further, can these maintain a fidelity to the form and content provided by multiple voices?

Collaborative cartography projects are contributing to the process of opening up mapping to reveal subjective engagement with place. Starting with the premise that places are fluid assemblages of stories, actors, and engagements, by sampling these stories we gain insight into the respiratory process of sensing and emotionally engaging with place. Of the various approaches discussed, this paper has examined the use of digital databases and cartography as a means of compiling and curating accounts of emotional engagement with places. The Rivers of Emotion case study has revealed the sorts of information a project focusing on emotions can provide and has examined the way stories combine to create broader understandings of spatial identity. I have also considered technical and theoretical limitations to the database and mapping work. While I cannot hope to find a comprehensive cartographic overview of spatial narratives entwining around a place, what a project of this nature does provide is a way of sampling and recognising consonance in river stories, sights, sounds, and scenes. The emotional offers a way of talking across and between oral histories and archival research. It provides way of compiling the living of experiences in different times and by different people, mediated through the recognition that we can identify our emotions in the expressions of others.

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