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Sustaining the Seas through Interdisciplinary Songwriting

Swim, swim

We swim in a rising sea

If parrotfish had political teeth

They'd bring the colour back to the Barrier Reef

Rock the boat, rock the boat

The health of Australia's Great Barrier Reef is in decline, largely because of the increased frequency of coral bleaching events (Hughes et al. 2017). Global warming, driven by carbon emissions from fossil fuels, elevates sea surface temperatures. This is the primary cause of coral bleaching, a phenomenon whereby the thermal threshold of a coral is exceeded, and the photosynthetic algae that live in its skin (from which the coral derives its color) is lost, leaving the coral without its primary source of food and susceptible to mortality (Hoegh-Guldberg 1999). Several global mass coral bleaching events have occurred since 1983, during which record high temperatures triggered pantropical coral mortality. On the northern Great Barrier Reef, a recent extreme mass coral bleaching event in 2016 killed up to 80 percent of live coral on reef crests (Hughes et al. 2018b).

The first serious environmental challenges to the Reef arose in the 1960s, when the Queensland State Government supported plans to mine the Reef for fertilizer, cement, gas, and oil (McCalman 2017, 77). From 1965 to 1975, Australian poet Judith Wright, artist John Busst, and forester Len Webb worked together in a decade-long campaign to protect the Reef. Combining their talents and resources, Wright, Busst, and Webb used the power of poetic language, the persuasiveness of scientific evidence, and the good fortune of political

connections to battle the Queensland Government's support of commercial exploitation of the Reef. Ultimately, they were successful and their advocacy resulted in the Reef's designation as a Marine Park in 1975, with special protections. In 1981, the Great Barrier Reef was made a World Heritage Site. Yet Wright was under no illusions. Later, she wrote of the ever-present threats to the Reef, "The Reef's fate is a microcosm of the fate of the planet. The battle to save it is itself a microcosm of the new battle within ourselves (2014, 186).

Today the challenges to the Reef are local and global: among the key threats, chemical and sediment run-off from land-based agriculture, coal mining, and overfishing are the responsibility of state and federal Governments, and climate change represents a far more complex set of global problems. Marine scientists aim to convey to decision-makers the seriousness of the Reef's predicament. The data are unequivocal. Many in the scientific community are frustrated that after decades of research, effective large-scale responses to coral reef decline are still not forthcoming. Scientists have made it clear that, although land-based practices play a role in water quality, the biggest threat to coral reefs around the world is climate change (Hughes et al. 2018a). In Australia, government leadership fails to develop appropriate emissions reduction policy; as of April 2019, it is not on track to reach its targets under the Paris Agreement. Given that science research and communication are not generating policy transformation, alternative approaches are needed.

Interdisciplinary Collaboration in *Mapping the Islands*

In recent years, marine scientists have acknowledged the limited capacity of their work to bring about decisive action on climate change (Hamylton 2018). Some have turned to collaborating across disciplines to experiment with new approaches, combining methods and exchanging knowledges to encourage stronger responses to reef decline. Working across

disciplinary boundaries unsettles established patterns of thinking and behavior. It has the potential to shift paradigms in both the academy and environmental management.

It is this current academic trend to foster interdisciplinary collaboration to solve "real-world" problems that sparked the project "Mapping the Islands: How Art and Science Can Save the Great Barrier Reef." Funded by the University of Wollongong's Global Challenges Program, a strategic research initiative to encourage transformative interdisciplinary research under the theme "Sustaining Coastal and Marine Zones," the project's initial brief was for coastal geographer Sarah Hamylton to remap a number of islands on the Reef that had been mapped forty-five years previously, with a view to observing changes to the islands. Hamylton was interested in how artists might approach mapping and how the involvement of other academic disciplines could influence her work. Human geographer Leah Gibbs and artists Lucas Ihlein and Kim Williams were invited to collaborate. Hamylton organized a fieldtrip: seven days on a boat in the central and northern Great Barrier Reef with marine scientists, a human geographer (Gibbs), an artist (Williams), and a host of others, visiting four islands.

Hamylton led the task of mapping the islands. The other stated objective was to create space for an unspecified collaborative process between Hamylton, Gibbs, and Williams. What emerged is the subject of this chapter: collaboration through music. The journey moves from mapping to music and beyond, through open-ended play and experimentation. Songwriting and singing are examined as potential ways to forge collegial relationships, bring our research to nonacademic audiences, and open new possibilities for academic research and impact. We explore how, in bringing a new voice to pressing environmental issues, collaboration across disciplines might offer useful ways of doing environmental research.

Music in Environmental and Social Justice Campaigns

The arts have played a key role in environmental and social justice campaigns over many decades. The growing field of science communication recognizes the value of pictures, theater, music, and poetry to prompt deeper engagement with environmental issues, particularly climate change (Evans 2014). This builds on a considerable historical national and global foundation. At the same time as Judith Wright was making passionate pleas to protect the Great Barrier Reef through writing and poetry (Wright 1977), the turbulent politics of the 1960s and 1970s saw the rise of antiwar, feminist, and civil rights movements. Within these movements, songs of protest and social commentary have galvanized widespread campaigning and political action, notably by American songwriters such as Joan Baez, Nina Simone, Pete Seeger, and Woody Guthrie, who symbolized these movements.

In the 1960s, Ted Egan wrote “Gurindji Blues” (1969) with Vincent Lingiari, at the height of the Gurindji land rights struggle and in the wake of the Wave Hill walk off in the Northern Territory. Elsewhere, Chilean songwriter and musician Violetta Parra pioneered the Nueva Cancion (New Song) movement, which aligned itself with the democratic presidential campaign of Salvador Allende. Into the 1970s, Parra inspired a generation through songs of social commentary, preserving folk traditions through compositions that honored regional Chilean musical styles. This political song movement “[gave] a voice to the people, bringing out what actually matters to people that are not quite empowered and giving them more power” (Ford and Rojas 2017). In Australia, rock band Midnight Oil confronted political issues over several decades through anthemic songs such as “Blue Sky Mine” (1990), and Yothu Yindi’s “Treaty” (1991) sang of Indigenous civil rights. Kev Carmody and Paul Kelly’s “From Little Things Big Things Grow” (1993) built on stories previously told about the Gurindji land rights struggle, and spoke of the growing reconciliation movement. The song continues to be recorded and performed by artists today.

Poetry and songwriting continue to have a role in contemporary environmental campaigns, as can be seen in public demand for stronger action on climate change. In 2017, the journal *Plumwood Mountain* published a volume of collected poems "Poets Speaking up to Adani" that emerged from a day of action, staged online, in which forty-three poems were posted as text, audio, or video, carrying messages about the environmental effects of the proposed Adani coal mine (Elvey 2017). In December 2018, thousands of protesters attended the Stop Adani march and rally in Sydney. Chants rippled through the crowd, bolstered by percussion, a brass band, a bagpipe player. Chanting with voices, rhythm and repetition brought cohesion and a shared sense of purpose. It was a powerful and simple technique that "gave voice" to people's concerns about the exploitation of coal in the Galilee Basin and the effect of coal on both the Great Barrier Reef and global climate change.

These traditions of political and social commentary across the arts offer rich context from which our explorations of music proceed. We examine the capacity of popular protest music to act as a conduit for shared ideas, expressing environmental issues simply and anthemically. Central to this creative strategy is collaboration; concurrently we explore the mechanisms and impacts of interdisciplinary collaboration. We ask the question: how can music—and particularly songwriting—provide an avenue for interdisciplinary collaboration?

Writing a Song on the Great Barrier Reef

On the Great Barrier Reef, we spent the week moving between four low, wooded islands on a sea in constant motion. The research vessel rocked back and forth, causing seasickness in some of the passengers. Days were spent conducting aerial drone surveys on the islands, underwater surveys from the support vessel, and scuba dive surveys on the fringing reefs. Land-based surveys were carried out on foot by circumnavigating each island. Each of these islands, though unremarkable from a tourist's perspective, offered a rich array of material for

the scientist, the geographer, and the artist. Underwater, small recruits of baby living corals were scattered thinly among a landscape largely composed of bleached or algae-covered dead coral. On the shore, the natural flotsam thrown up by waves, currents, and winds was entangled with a vast array of human detritus: thongs, fridge doors, fluorescent tubes, and, most starkly, plastics of all kinds.

Back on the boat, evenings were spent in the saloon. In this relaxed atmosphere, spontaneous singing and playing led to the collective writing of a song about the Great Barrier Reef, inspired by the rocking boat. Songwriting provided a light-hearted activity that was a timely and welcome antidote to the physical and mental strains of days in the field. Collaborative writing of the lyrics to *Rock the Boat* (Williams et al. 2018) wove together marine science, environmental politics, and rhythm and meter. The process revealed the capacity of music and song to bring people together to share a joyful experience and transmit complex ideas through lyric and melody. It revealed our knowledge of and passionate views about the Reef, evident through our lyrics, a blend of science, pop poetry, and activism. Later, we continued the songwriting process by developing a set of extensive footnotes, embedded in the musical notation of the song, to capture some of the cross-disciplinary discussion that took place on the boat (Figure 22.1). The footnotes allow diverse knowledges to expand the compact text of the lyrics into a broader conversation. For brevity, we have included only a few footnotes; a full version is available alongside the audio files of the recorded track (https://bluespottedrays.bandcamp.com/releases) and also with the published musical notation (Gibbs et al. 2019).

<Figure 22.1 near here>

Rock the Boat

Verse 1: *Say you wanna see anemones*

Float around the reef awhile[1]

Take a little time to cool it down

Gather all your friends and make a sound

Chorus:

Rock the boat . . . rock the boat

Rock the boat . . . rock the boat

Verse 2:

Coral ain't made for a boilin' pot

Nemo likes the water cool not hot

Makin' way for the blue spotted ray

Wave your little fins and have your say

Chorus

Bridge:

Swim . . . swim

We swim in a rising sea

If parrotfish had political teeth[2]

They'd bring the colour back to the Barrier

Reef

Chorus

Verse 3:

On and on the turtles hatch

Damselfish, keep tending their patch[3]

If you want your reefs to stick around

Better keep the carbon in the ground[4]

Chorus to finish

Notes

[1] The Great Barrier Reef (GBR) attracts more than 1.6 million visitors per year (Australian Government, no date). It is the world's most extensive coral reef ecosystem. In 1981, it was listed as a World Heritage sSite, based on four of the World Heritage Convention's ten criteria: (7vii) "'The GBR is of superlative natural beauty above and below the water"'; (8viii) it "'is a globally outstanding example of an ecosystem that has evolved over millennia"'; (9ix) "'the globally significant diversity of reef and island morphologies reflects ongoing geomorphic, oceanographic and environmental processes"'; and (10x) "'it is one of the richest and most

complex natural ecosystems on earth, and one of the most significant for biodiversity conservation"' (UNESCO, no date). As well as protecting tremendous ecological and physical diversity, the Great Barrier Reef GBR contributes more than $5 billion to the Australian economy, and generates about 63,000 sixty-three thousand jobs (Australian Government, no date).

[2] Who does have political teeth? The Grattan Institute report *Who's in the rRoom? Access and iInfluence in Australian pPolitics* (Wood &and Griffiths 2018) highlighted the vulnerability of Australian politics to well-resourced interests (big businesses and industry coalitions) who that use money, resources, and relationships to influence policy to serve their interests, often at the expense of the public interest. In *The Coal Truth*, David Ritter (2018) exposed multiple interweaving sources of political power in the Australian coal industry, stemming from excessive spending on political lobbying and donations and exaggerated claims of the national economic significance of coal. Another strong influential force within Australia's political systems is the continual shifting of individuals in and out of roles in politics, fossil fuel industry groups, and energy and mining companies in a phenomenon dubbed the "revolving door" (Krien 2017). Such influence operates through promises made, factions formed, donations offered, and royalties and taxes agreed, and is thought to underpin remarkable changes in the attitudes of elected Pprime Mministers towards coal (noteworthy transitions include Tony Abbott, Julia Gillard, Malcolm Turnbull, and Scott Morrison). Against such powerful lobbying, how can the political teeth of parrotfish—and other nonhumans invested in the survival of the Great Barrier Reef—be sharpened?

[3] Herbivorous damselfish are notoriously territorial and adopt "'farming"' behaviours to maintain their algal "'lawns"' (Lassuy 1980).

[4] A report by the Climate Council (Steffen 2015) estimates that if the coal from the 250,000- km^2 Galilee Basin in western Queensland was burned, it would release 705 million tonsnes of CO_2 carbon dioxide each year, more than 1.3 times Australia's current annual emissions. Consequences for the reef have been reported by scientists for decades. They include increased ocean acidification, which reduces the capacity of corals to build their calcified skeletons (Kleypas et al. 1999), and coral bleaching (Hoegh-Guldberg 1999).

Singing and Songwriting for Interdisciplinary Collaboration

Alongside the pragmatics of mapping the reef islands and writing a song on the boat, the possibilities opened up by the process of interdisciplinary collaboration have emerged as a further focus of our work together. Philosopher Margrit Shildrick regards meaningful interdisciplinary collaboration as a form of Deleuzian assemblage (Shildrick et al. 2018, p. 5). The concept of assemblage asserts that sense or meaning is provided by the *connection between* specific concepts and the *arrangement of* those concepts (Deleuze and Guattari 1988). It is through this specificity that songwriting offers insight for our collaborative research.

Shildrick's research explicitly brings together the arts, biosciences, and humanities "to explore the complexities of heart transplantation without privileging any one discourse." Adopting the idea of a research assemblage, Shildrick found that working alongside her collaborators "breaks through disciplinary silos to enable a fuller comprehension of the significance and experience of heart transplantation in both theory and practice." Through her experience of collaborative work Shildrick poses a series of questions, which we adopt to help us examine our own project:

- What happens when people collaborate across disciplines?
- How can we do it well?
- What new insights might emerge?
- How might collaboration change the way we think?

What happens when people collaborate across disciplines?

The published literature on interdisciplinary research methods foregrounds the challenge of bringing people from different disciplines together, including the tension of reconciling quantitative and qualitative methodologies (Lach 2014) and the need to define a new focal scope in the absence of disciplinary boundaries (Lyall et al. 2015). That no individual researcher in our team works with a full knowledge of the project's ultimate end-point has sustained these tensions. These tensions were productive in terms of building relationships that truly incorporate different disciplinary viewpoints. This requires each collaborator to experience a degree of disciplinary discomfort, faced with unfamiliar expertise, and accept that the emphasis and focus of the project may continue to shift through time.

Creating the song *Rock the Boat* gave us a collective confidence that none of us had alone. Some of us could play guitar or ukulele, others were happy to sing or shake maracas. None of us are professional musicians. As the group puzzled together over lyrics, the conversation turned from damselfish grazing habits to rates of sea level rise to the number of syllables we could squeeze into a line of the song to the hopelessness of Australian energy policy and political corruption. Most of us had never written a song before. The process took us beyond the scope of our individual experience, skills, and knowledge, but more importantly, it granted us

a freedom to reach beyond our customary practices and disciplinary conventions for conveying our understanding of, and opinions about, the environment.

How Can We Do It Well?

Interdisciplinary work takes time. It entails building relationships, including respect for, and trust in, each other's judgment, as well as learning about the objectives, underlying philosophies and practices of other disciplines, and accepting the limits of one's own knowledge domain (Bridle et al. 2013). An interdisciplinary collaboration is therefore well supported by participants who have patience with the research process. Drawing on the idea of a "knowledge democracy," in which all actors have access to and ability to put their knowledge forward in the process of solving societal problems, Bunders and colleagues (2010) distinguish two dimensions of interdisciplinary collaborative research as the *degree of knowledge input* in the project, and the *degree to which nondominant actors are explicitly involved in the decision-making that shapes the research agenda*. The act of songwriting emerged as an inclusive experience in the sense that all participants were present and actively engaged in writing the song, with adequate consideration of their contributions, viewpoints, and expertise. The later inclusion of footnotes to the song was a useful tool for representing broader dialogue that occurred as the lyrics were put together, and formed an additional layer to our interdisciplinary work. This allowed the song to go beyond an assemblage of human voices and musical notation, providing a novel basis for connecting the ideas within the song lyrics to scientific data and political commentary.

Identifying and selecting a single initial objective—creating a song—provided a focus for working together. It demanded choosing a disciplinary approach, which in turn required all of us to sit with the unknown, to work toward unfamiliar objectives that demanded a leap of faith. Our

emergent relationship of respect, and practice of listening and collaborative decision-making, helped each of us trust the process.

What New Insights Might Emerge?

Returning to the conceptualization of interdisciplinary collaboration as assemblage, the process of songwriting offers a new way to *connect* and *arrange* concepts. As the scientist's familiar delivery of content moved from the prescriptive template of introduction, methods, results, and discussion, so decisions about what ideas were of greatest interest, and how to connect and present them, evolved. When each of us writes outside of our discipline, we do so in an emerging interdisciplinary field that is not so thoroughly mapped as the established disciplines to which we belong. As the format of what is being written shifts from journal article to song, the objective of the writing changes. This opens up intellectual space where researchers have a wide set of ideas from which to draw, and a broad range of methods and practices for arranging ideas. It's not just about what is communicated, but *how*. For example, in the lyric "Coral ain't made for a boilin' pot / Nemo likes the water cool not hot," the songwriting process allows us to strategically adjust scientific findings for literary and affective ends. For example, the popular character from the 2003 Pixar film *Finding Nemo* is used, metonymically, to represent the entire Great Barrier Reef ecosystem. Also, poetic license is taken with two scientific facts to dramatize the threat to the reef by rising sea temperatures: strictly speaking, sea surface temperatures are currently well under that of a "boilin' pot," and the optimal aerobic temperature for a reef fish is 29°C, not exactly cool. Thus, the literary conventions of songwriting compress a set of complex ecological facts into a catchy couplet that goes beyond the standard manner of science communication,

potentially allowing research insights to be shared *affectively* with broader and different communities.

How Might Collaboration Change the Way We Think?

In the context of the ecological sciences, Scheffer and colleagues (2015) outline a duality in the way scientists typically think, based on both intuition and reasoning. *Intuitive* thinking can help us see novel solutions and associations instantly, but is prone to error; *reasoning* checks and modifies results and represents the generally accepted ways of doing science. They emphasize the value of unstructured socializing time, shared exploratory experiences, and cooperation between artists and scientists, for stimulating scientific progress by encouraging intuitive thinking. In this regard, songwriting in our project emerged as a productive approach to interdisciplinary collaboration as it created the conditions for shared structured and unstructured dialogue from which generative discussions emerged. These went beyond educating each other about our respective disciplines to engaging in each other's disciplinary practices and also to entering into a *new shared space not fully belonging to any of us*. The production of a song contrasted with the standard outputs valued in many disciplines; it demanded a reconceptualization of the validity of different output forms, including creative outputs.

An authentic collaborative project that involves researchers working together to design a research project from the outset demands that varying disciplinary objectives are encountered early. Whereas a scientist may seek to reduce the world to a measurable unit that can be manipulated with the intention of posing and testing a hypothesis, an artist may seek to open out the thinking of their audience or provoke a discussion, and a human geographer might aim to critique and reveal the sociocultural processes underlying an issue. These three approaches adopt

fundamentally different approaches to the research task. When taken together, they constitute an entirely new research question, shifting, for example, away from the cliché of using art to communicate science.

Concluding Remarks

Through our interdisciplinary collaboration, a sense of collective confidence that would have eluded each of us alone has emerged from the process of writing a song about the environmental plight of the Great Barrier Reef. This confidence allows us not only to move beyond our individual skills and knowledge, but to extend beyond our customary practices and methods, and reach new audiences with our work. Songwriting has emerged as a democratic form of knowledge production, in the sense that it allows all researchers to be actively engaged in writing lyrics, arranging and performing, and to have their knowledge represented. The work is broadened through the addition of footnotes to the lyrics, placing the research in a hybrid space between essay, in which footnotes are conventional, and song lyrics, which reflect the traditions of popular music. Adopting an unfamiliar objective from the outset takes each of us outside our customary way of doing research. In bringing together artists, scientists, and a social scientist to engage in a shared research exploration, the act of writing a song combines intuitive thinking with reasoning to provide a new avenue for connecting and arranging concepts in generative dialogue.

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