

Water futures, biosociality, and other-wise agency

An exploratory essay

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ABSTRACT: This article maps the confluence of biosocial relations through the agential networks of water. In the language of the environmental humanities and social sciences, such relations and networks are biosocial and sacralised (Meloni, Williams, Martin 2016; Mangiameli 2013). The self-organisation of aquatic environments in these relations towards humans is engaged in an ongoing process of entanglement and adaptation in parallel with human understandings and approaches to water. This article imagines new and conscientious behaviour that might treat the ubiquitous river more gently, against the tensions and provocations of the Anthropocene Epoch. It argues for the development of fresh sustainability logic; a hydro-logic that cultivates connectivity, adaptive capacity, and broader water values that exist beyond the containment of the commodification paradigm (that are particularly evident among First Nations peoples). This logic necessarily includes a reconsideration of economic, ecological, customary and recreational values in more balanced measure. By configuring water as a complex adaptive stream of intra, inter and extra-relationships, this research champions waters' multi-dimensional capacity and agency for the purpose of advancing more sustainable biosocial water futures within a geosocial matrix.

KEYWORDS: WATER LITERACY, CONNECTIVITY, BIOSOCIAL ANTHROPOLOGY, SACRALISATION, INDIGENOUS AUSTRALIA.

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Water Futures, Biosociality, and Other-Wise Agency: An exploratory essay

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Introductory genesis

Water, was simply there in the beginning, indispensable, and life has made its adjustments accordingly.

Braun, Cavagnaro 1971¹

In 2010 Mikhail Gorbachev former Soviet President and now a commentator for equitable life on earth, declared what too few know, that: «The United Nations estimates that nearly 900 million people live without clean water and 2.6 billion without proper sanitation [...] This humanitarian catastrophe has been allowed to fester for generations. We must stop it»². Water has been poisoned, we have been poisoned and we are the poisoners. Planet Earth is comprised of approximately 75% water; so too the human body and most forms of life. In the developed world, we expect it to fall freely from the garden or household tap, while in other world's people have adapted to living without its clean and continuous flow, while still others have polluted it and become indifferent to its value and qualities. Despite water metaphors that saturate our living speech, water's presence, customary and cultural value and generative capacity, increasingly exists on the margins of consumer consciousness. This article aims to vitalise trans-disciplinary debate on the theme of aquatic sustainability and its biosocial entanglements, and dares to ask if we can re-imagine a world of *one water* equitably shared and holistically appreciated through an anthropologically informed geosocial optic.

Braun and Cavagnaro wrote, as long ago and as recently as 1971 that, «water is the river upon which evolution has charted its course» (1971: 54). In its unique triadic forms of gas, liquid and solid, water is the fundamental particle of all life; present in humans, non-humans, in minerals, earth and wind, and according to First Nation Peoples, in the spirit and the intangible (Acret, Bragg, Gordon 2007) «Visible water (blue) – such as rivers, rainfall and aquifers – and invisible (green) water content of soil and evapotranspiration from plants» (Groenfeldt, Schmidt 2013: 2) is present everywhere, and in the unseen air we breathe. Its omnipotence is so great that it mobilises and contains other life forms, acting as a sacred conveyer belt for all life, that is capa-

1. This article acknowledges the prescient work of Ernest Braun and David Cavagnaro, *Living Waters* (1971).

2. See Mikhail Gorbachev, The Right to Water, *The New York Times*, July 16, 2010 (accessed on 12/02/2010), who regularly speaks the willful damage human beings do to the planet.

ble of carrying «nearly half the known minerals without itself being altered» (Braun, Cavagnaro 1971: 24). «As the gestational matter of our being, water also expresses our actual responsibility and our virtual potential» (Neimanis 2009) – it is more a part of us than *any thing*, and, as this article suggests, it is in conversation with other elements and beings.

It is a tragedy that even with these facts, human aquatic irreverence may have permanent consequences before we collectively become re-aware. Despite pre-Enlightenment sacralisation, water has fallen from grace in the modern economy of human/nature relations (Dawson 2014; Wouters, Chen 2013; Hawke 2012; Barlow 2010; Gorbachev 2010; Neimanis 2009). This article navigates our intrinsic relationship with, and scholarly critique of water beyond purely extrinsic commoditisation frameworks, and imagines new conditions of possibility for water futures down the temporal and spatial complex adaptive stream.

From fixed subordinate to fluid co-ordinate

The intentions of this article are twofold: to demystify the wonder and troubles of water and more broadly nature, by meshing biosocial anthropology with cross-cultural water literacy and other-wise knowledge towards a geosocial literacy. Secondly, it untangles relations of water as an environmental, cultural and economic element, ancestor and resource. It problematizes solutions for the complex challenges to waters enduring and equitable flow through increasingly muddy waters. That the hydro-logical cycle is a complex adaptive system³, is a given. An *a priori* understanding of the symbiotic relationship between inter-system enmeshments, nature-cultures (Latour, 1993), and the collision between the elemental and human is assumed. The article also seeks to disrupt existing reductionist Cartesian dualisms that misrepresent and disavow “nature as passive”, in preference to “active culture”. It offers instead a mapping of ontological entanglement at the biosocial level, and between other systems variously governed.

To understand the departure from Descartes static binary system, it is worth considering the origin of his incomplete narrative analysis of Anaximander’s (580 BCE) original source material. The Milesian philosopher constructed the first rendition of the dualisms, as a continuum of reciprocity and transition. In this schema, all components are of equal power and phenomena such as dry/moist, limit /without limit, male/female, and active/passive are situated as being equally contingent on the qualities of the co-produced.

3. Ilya Prigogine (1977) originally (with Isabelle Stengers) coined Complex Adaptive Systems Theory.

The idea of *ongoing becoming* rather than *fixed being* is evident in Pre-Socratic works such as Anaximander's proposition that all things were indefinite, boundless and in constant motion (*apeiron*); a necessary dynamic flux on which all things depended, with no one component ever claiming primacy. In such a schema, water was as vital as any matter or form it related to, while also containing intrinsic value. However, over millennia man claimed primacy and threw nature and the notion of flux into containment, with nature increasingly technologized and fixed as a subordinate, both disassociated and over-used by developing human enterprise.

This raises one of the over-arching provocations of this article: that for actual life preserving innovative change, humans (as the existing privileged actors), might be decentred, and water (and more broadly nature) reconstituted as a central and agential force in sustainable life. What follows is a re-consideration of water's multi-dimensional currents, values, and agency. A re-mapping of multiple knowledges superimposed with Complex Adaptive Systems theory (CAS), is offered as a methodology that could produce both qualitative and quantitative results that validate *the sacralised* (Mangiameli 2013) agency of water in conjunction with its utility values, that we argue could produce more effective governance. Ethnographers and First Nations People – as guardians of elemental knowledge (Whyte 2016⁴; Maclean *et al.*, 2012; Acret, Bragg, Gordon 2007; Waters 2004) – have much to offer this aqueous narrative cartography that enacts a timely and provocative re-reading of water through an Indigenous «bio-respecting» lens (Waters 2004). Biodiversity and cultural integrity are constitutive of bio-respect; reconciliation of competing interests and values (Davis 1998)⁵ between settler descendants and Indigenous people are critical for a re-visioned water future.

We advance notions of «biosocial becomings» (Ingold, Pálsson 2013) and «cross-cultural water literacy» (Hawke 2012) to generate openings to new and hopeful hydro-logics of biosocial resilience and sustainability governance that might go some way towards protecting waters place in planetary consciousness, as well as within its utility framework. Drawing upon Haraway's work (2003) on the other-than-human we address the broader issue of cross cultural and elemental literacy that is inclusive of flora, minerals and elements.

4. This and other papers by Whyte provide scholarship from First Nations American people.

5. See Anne Waters (2004) and Michael Davis (1998) on bio-respect and bio-prospecting. Davis' work is as prescient as the work of Braun and Cavagnaro but in a political context.

Mapping complex adaptive biosocial relations in the Anthropocene

I am the river / The river is me
Whanganui Iwi, Aotearoa/NZ⁶

The challenge for the Anthropocene Epoch in which we find ourselves, we argue, is to regain nature consciousness and develop “other-wise” cross-cultural elemental literacy (Hawke 2012), to decipher the tangible and intangible conversations between humans and other agents. This nature consciousness and elemental literacy is already at odds with the multiple shocks and perturbances to nature instigated by human impact, since the “Great Acceleration” period of the 1950s (Steffen, Crutzen, McNeill 2007). To amend the errors of the past as they play out in the current water and broader climate change crisis of the Anthropocene Epoch, engaged and trans-disciplinary thinking, and re-animated conversations with all actors seems timely. This includes conversations with the other-than-human, and the rest of nature, but how does such a dialogue play out? How is nature listened to? What does nature make of our babbling evolution and diminished capacity to *be with*? Must the biggest voice win?

These are important questions to ask within our own cultural contexts and entanglements with other cultural contexts and nature itself. It is no simple task, but as Muecke (2007) suggests «We have ways of making them [nature] talk and bear witness [...] humans and non-humans have always been in it together»⁷. Water, «companion species» (Haraway 2003) and human futures then, are co-implicated and polyvocal at the outset. The next question is: how does that co-implication evolve?

In the context of this article, resilience thinking, as a pedagogical tool is wed to sustainability and complexity theory at the biosocial level that evolves more deeply into a geosocial literacy. For systems to thrive and remain dynamic they must exist within a framework of resilience, cited by Brian Walker (2006) as, «[...] the capacity of a system to continually change and adapt, yet remain within critical thresholds»⁸. Meshing resilience think-

6. Whanganui Iwi trustee Gerrard Albert, speaks on the Whanganui River’s grant of legal status in its own right – as a subject and legal person Te Awa Tupua, not an object (*New Zealand Herald* 5/8/2014) www.nzherald.co.nz/wanganui-chronicle/news/article.cfm?c_id=150-3426&objectid=11306455 and as cited in the following document: <http://nz01.terabyte.co.nz/ots/DocumentLibrary/140805RurukuWhakatupua-TeManaOTeAwaTupua.pdf>, p.5.

7. See Stephen Muecke’s provocative essay *The Cassowary is Indifferent to all This* (2007), in which he invites the unruly Cassowary as representative of nature to the Interdisciplinary Institute for the Diplomatic Negotiation among Humans and Non-Humans that locates nature as a witness, author and co-director. See also Haraway 2003.

8. See Brian Walker speaking for the Stockholm Resilience Centre explaining resilience: www.stockholmresilience.org/21/research/what-is-resilience.html (accessed on 25/02/2014).

ing with the anthropological premise of biosociality put forward by Ingold and Pálsson (2013) fits Condit and Railsbrack's (2005) notion of "transilience" as a non-reductionist set of laws that connect different modes of being. Pálsson and Swanson (2016) more recently argue that advancing a notion of «geosocialities» (the comingling of the geological and the social, and the sensibilities involved) and drawing upon recent scholarship on «new materialism» (Lemke 2015) and «vibrant matter» (Bennett 2010), offers a trajectory for thinking sustainability at intra, inter and extra relation levels. It further expands the conceptions of agency, intimacy, and politics that have emerged from "biosociality":

The geosocial at once facilitates appreciation of the mineral and draws attention to points of contact between geology and social-cultural theory. At the same time, it opens up a down-to-earth form of "geopolitics" (the managing, and mismanaging, of geosocial realities) that exceeds classic notions of the term, attending to different "geological" scales, to living bodies, human and non-human, solid rock, and the planet itself (Pálsson, Swanson 2016: 151).

The geosocial, in this vision, of course includes water, the assembly or comingling of the aquatic, material, human, and non-human. Humans in particular are engaged in webs of biosocial relations, and «may be usefully regarded as fluid beings, with flexible porous boundaries: they are necessarily embedded in relations, which may be called biosocial» (Pálsson in Ingold, Pálsson 2013: 39). Biosocial and geosocial entanglements are predicated precisely on active connectivity and coherence between different systems such as nature and culture but in the context of this discussion specifically on water and other living things, as simultaneously biosocially individuated, and connected (Prigogine 1980).

The Hydro-logical Cycle (see Fig. 1) is ostensibly circular with complex intrinsic and extrinsic relations; it follows its own logic and privileges itself as the «omniscient narrator» (Hawke 2014: 1) arguably unworried by our response to its oscillations and extremes. The interconnections of the cycle create changing patterns that emerge and inform the behaviour of the system itself. While it is a system, it does not operate as a fixed order system – its lack of order is in fact its strengths, as with other robust complex adaptive systems. Systems that have "co-evolved", are most resilient when they are dynamic and exist "on the edge of chaos" rather than in a state of fixed equilibrium with a nucleus (Prigogine 1982).

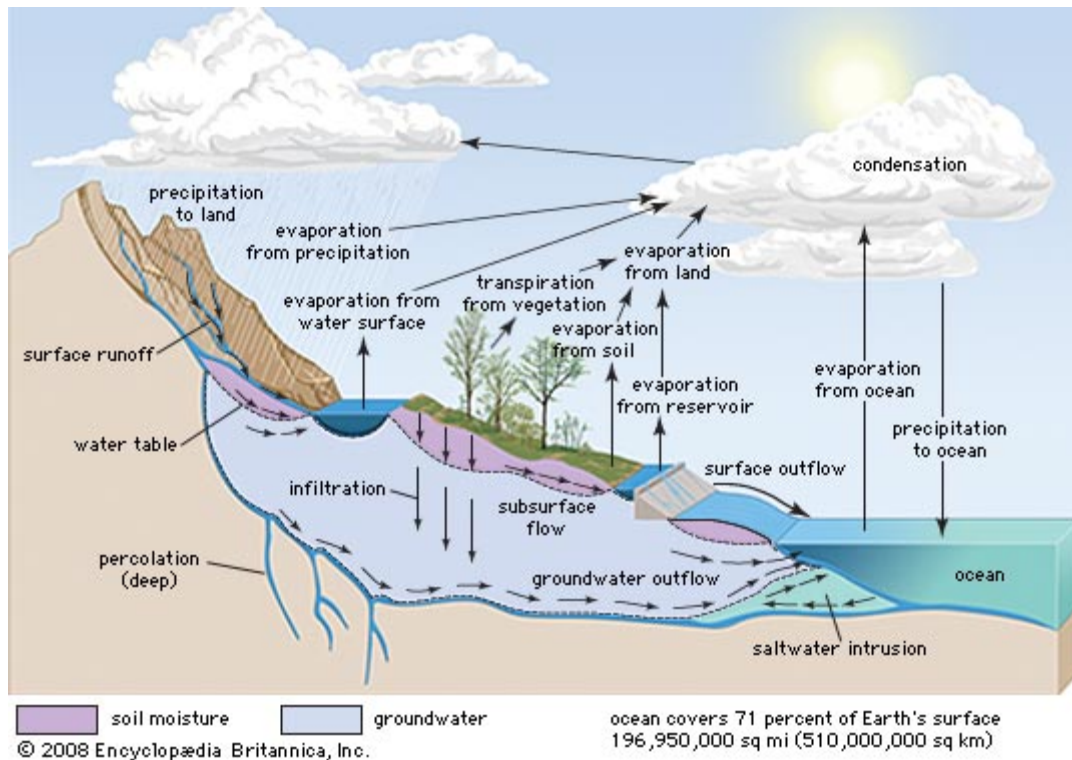


FIG 1: *The Hydro-logical Cycle: implicated in relations with humans, land and water forms, more-than-human actors and interconnecting aquatic systems, weather, and catastrophe.*

Here, the river example is immediate. It is dependent on rainfall and the other components of the hydro-logical system, as well as human and non-human impact, such as flora, fauna, the abiotic, damming and catastrophe. In Indigenous Australian ontology, cosmogenic Dreamtime design, ancestors and the intangible properties of water are also part of the systems design and governance⁹. Water also delivers nutriment to other stakeholders through its seasonal patterning and aquatic architecture, promising much but distributing in tune with its own volition, and in recent times, in response to human impact.

This article argues that in the Hydrological Cycle or *Round River* as Indigenous Widjabul First Nation People refer to it (Hawke 2012: 240; Acret, Bragg, Gordon 2007), there is no centre/margin mechanism, rather there is constantly moving inter-relationship or co-productive connectivity within and between all parts that appears very much in line with Anaximander's early

9. The Dreamtime refers to Australian First Nation Aboriginal Creation Stories and Cosmogony. Maori Creation stories also rely on spiritual design. Both modes of creationism are generally under-represented in western science, politics and governance.

proposition of mutuality and flux rather than static opposition. In the Indigenous Australian Creation schema (and borrowing from Bourdieu 1978), ontological understandings of the *Round River* consist simultaneously of natural/ecological capital, symbolic/ancestral capital, and economic/resource capital. Recognition of waters' symbolic/ancestral capital may enable a broader comprehension of waters agency and value as something other than just consumable resource, and as co-author of Creation, and as Bird Rose suggests, «as its own self» (2007: 18), dynamically engaged in a complex adaptive arrangement of inter-relation.

Agential sacralisation and the chaotic

In addition to the cross-cultural collaboration between the Widjabul First Nations People and Rous Water of Northern NSW Australia (Acret, Bragg, Gordon 2007), recent scholarship and practice (and case studies) from Italy and Aotearoa further advance the notion that water is an agent in its own becoming with tangible and intangible values. These positions are recognised by both Indigenous people and settler or post-colonial researchers and bodies of governance. Recognition of both sacramental and utilitarian values in water offers new opportunities for water reform governance. Waters' agential capacity and symbolic capital, for example, is trans-formatively rendered through Mangiameli's (2013) recent work on the human-aquatic relationship in his ethnographic case study of the Kasena People of NE Ghana. Mangiameli recognizes the people's view that water is a sacralised entity, as well as being a life-sustaining product. The Kasena people, readily articulate and demonstrate a "sacralization of nature" totally embedded in the unpredictable and multifactorial process through which the world takes shape [...] and in which the human is a relevant component but not the director» (Mangiamelli 2013: 147). Mangiameli's extensive fieldwork leads him to an astute analysis of the generative and sacralised abiotic agency of water that decentres the human as director. He writes:

If habits are [...] inserted in a flux that connects them to what they give rise to, on the one hand, and to what generates them, on the other, then the habits of water emerge from a similar spiral. [...] After all, water adapts itself to the surface of the land, but at the same time modifies the surface itself (2013: 146-147).

The intentional meshing of complexity theory, resilience thinking, bio- and geosociality and "other-wise" knowledge, signifies a judicious turn in the environmental humanities. This departure from an old paradigm of

over-use recognizes the necessary integration of natural capital and social culture, that heralds a new era of water diplomacy and innovative, cross-cultural hydro-logical geosociality.

The recent case of the Whanganui River in Aotearoa/New Zealand being granted sovereignty is a case in point. The Whanganui River is recognized as a *being*, a living entity, a legal personage: «Te Awa Tupua, with its own values, rights and voice»¹⁰, with tangible and intangible capital, that potentially situates geosociality as a new mechanism in understanding and talking water.

Water sovereignty and sacralisation provide hope that natures' agency and capital can further connect interactions between aquatic and human agents that embrace the qualities of biological and cultural connectivity towards sustainability and mutual respect in human and elemental inter-relationships. As Prigogine has stated (1982: 46), the change towards this biosocial conversation and arrangement requires «a new dialogue of man with nature» which this article further advances through the prism of cross cultural water literacy demonstrated in the case studies of the Kasena of NE Ghana, The Whanganui Iwi, and the Widjabul of the Northern Rivers of Australia.

In concurrence with Waldrop's articulation of complexity (1992), and Walker and Salt's (2006) case studies on resilience and complexity theory, we recognise the factor of the "edge of chaos" as problematic in the current state of play, in the world's rivers systems. Waldrop explains the chaos component of the theory as follows:

Chaos by itself doesn't explain the structure, the coherence, the self-organizing cohesiveness of complex systems [...] This balance point called *the edge of chaos* – is where the components of a system never quite lock into place, and yet never quite dissolve into turbulence, either [...] It is the constantly shifting battle between stagnation and anarchy [...]¹¹.

Resilience thinking and geosocial methodology can produce innovative pathways in the way a variety of governing bodies (community, local, state, federal and international) might read and approach the strategic and respectful management of water and its broader relations. Resilience thereby becomes part of the system and resilience thinking part of its governance under different cultural conditions. As Groenfeldt and Schmidt explain, «without values, governance has no referent for adjudicating competing demands» (2013). As a pliable tool for change and reform,

10. The Whanganui River Settlement: <http://maorilawreview.co.nz/2014/05/ruruku-whakatu-pua-te-mana-o-te-awa-tupua-upholding-the-mana-of-the-whanganui-river/>

11. In this book M. Mitchell Waldrop "adapted" CAS form Prigogine's original concept.

Folke *et al.* (2002) further argue that resilience thinking is the ground on which to build sustainability in a world that transforms itself daily:

Resilience for social-ecological systems, is related to (i) the magnitude of shock that the system can absorb and remain within a given state; (ii) the degree to which the system is capable of self-organisation and (iii) the degree to which the system can build capacity for learning and adaptation. Management can destroy or build resilience, depending on how the social-ecological organises itself in response to management actions (Folke *et al.* 2002).

Resilience is therefore co-related to dynamic complexity and geosocial cognizance. Rebecca Dodder and Robert Dare (2000) articulate the advantageous confluence of ideas and practice: «Dynamic complexity encompasses the ideas of complexity related to behavior, processes of cause and effect, feedback, fluctuations and stability, cycles and time scales¹²», that we extend to include geosocial complexity and potency.

The Anthropocene epoch, by its very definition, has over-drawn from the water account and subsequently over-delivered on shock and perturbation to some river systems, resulting in flawed confluences. Economic development, greed and necessity and the results of the Great Acceleration (Steffen, Crutzen, MacNeil 2007) from 1945 onwards have all played a part, and nowhere is human impact more to blame. In recent decades a plethora of agencies and international reports (UNESCO; Stockholm Resilience Centre; World Water Council and European Union Water Initiative to name a few), have produced recommendations for the securing of better water reform and sustainability practice. These agencies provide opportunities to re-negotiate and implement inclusive amendments to policy and practice in which equitable allocation is designed for all agents (both natural and cultural), within systems that must remain complex adaptive, dynamic and generative. Yet governance is itself a complex system that will co-evolve with its agents slowly (Brondizio *et al.* 2016).

Learning from flawed entanglement

Down the river the water of life encounters an enigma – a species that has, for the moment, forgotten the source.

Braun, Cavagnaro 1971

Thinking through a geosocial and resilience matrix enables the recognition of intra, inter, and extra relational junctures of water story. Any water form, be it a stream or a cirrus cloud, or the whole hydrological cycle, is part of a web of relations with people and the earth, and other-than-human. As

12. See Dodder and Dare (2000) for another “adapted” or applied explanation of CAS.

discussed, the cumulative and generative systems are non-linear, diverse and mutually beneficial to all components – or mutually destructive. The Hydrological Cycle, as an enclosed mechanistic system, moves water around the globe in the forms of vapour, liquid and solids to nourish the complexities of planetary wellbeing dynamically. There is the same amount of water on the planet as there ever was moving in this endless system. However, some parts of the system have become polluted, stagnated and perturbed beyond use.

In 2009 Maude Barlow Senior Advisor to the UN on Water claimed without apology that the World Economic Forum had conceded that «the world is on the edge of water bankruptcy» (2). She problematized the currency of water by explaining that

We are polluting massive amounts of surface and even ground water rendering it inaccessible to us; As a result we are over extracting our rivers to death, mostly for flood irrigation and to grow crops in deserts, creating more deserts (Barlow 2009).

Nowhere is this more evident than in the damming of the Yangtze River with the Three Gorges Dam in China¹³. China finds itself increasingly under scrutiny by inter-governmental agencies. This «modern water» (Linton in Neimanis 2014) strengthens the apparatus of the state in the short term but fails to recognise the flow on effects of over extraction and shock, as well as the increase in unsustainable business populations that result in putrefication. For example, as Wouters and Chen (2013: 232) explain

Recent reports highlight China's impending water crisis which will only be exacerbated with further economic development; already 11 of China's 31 provinces suffer from water scarcity... One recent report claims that some 28,000 waterways have vanished from China's maps as a result of pollution.

Almost in contradiction to the dire state of play in the interior of the country, China's transboundary water management intentions reflect the gaze of international agencies. But as Wouters and Chen (2013) have noted, regard and intention do not always translate into effective global practice, with China demonstrating a "soft path" to transboundary water cooperation.

China implements the "soft-path" primarily through bilateral high level meetings and in selected multilateral forums (such as ASEAN, BRIC and SCO) in accordance with China's [...] approach to international coexistence. While this approach has many positive effects [upstream], the difficult challenge for downstream states related to the development activities by geographically advantaged upstream states, remains a "hard" problem (Wouters, Chen 2013: 241-242).

13. See *Rivers of Life*, by Australian Broadcasting Commission (2009) that details the biosocial issues connected to the development of this and other dams. www.abc.net.au/tv/guide/abc1/-201207/programs/ZY9991A001D2012-07-02T123111.htm

Not unlike the Chinese situation, Australia's Murray Darling Basin Plan that includes the opening and shutting of weirs and dams in relation to perceived needs (built on western agricultural practices arguably unsuited to the land, waterscapes and weather patterns) also conducted simulations that fell short of actualities. The extreme drought of 2006-2007, for example, was not anticipated by the Murray Darling Basin Authority; simulations and projections failed, despite a similar episode being on the record for 1914¹⁴. The sophisticated regulation of flows through pipelinisation (Hawke 2014) of the Murray Darling Basin to feed introduced crops presents no solution in such an erratic land and waterscape. Realistic cognizance of actual resource supply and associated values must be embedded in economic development and political governance. Over-drawing from the aquatic account without real possibility of consistent replenishment lends itself to the water bankruptcy that Barlow speaks of, and begs the questions: How water literate are we and can we learn from this? We do indeed stand at the precipice.

Man is only one of the many families of living things [...] In view of the devastating impact he has had on the ecosphere [...] nature may consider him an experiment as yet unproved (Braun, Cavagnaro 1971: 24).

It is perhaps here on this catastrophic cascade that a "conversation" between the natural aquatic world and the cultural world could take place so that the ecological, economic and cultural considerations of all stakeholders, including nature, can be held in more constructive alignment. But at this meeting place called the river, who will be the interlocutor? How does one talk or listen to a river?

Dynamic water innovation and cross-cultural geosocial literacy

Like the habitus, which is a system of structured and structuring dispositions (Bourdieu 1972) the flow of water is moulded by those external conditions that it contributes to moulding at the same time.

Mangiameli 2013: 148

There is some intelligent hope for an enriched and diverse understanding of waters agency, and for its future in many currents of the world. Both the challenge and the solution for the Anthropocene epoch is to grow the right thinking, right action, gratitude and a spirit of hospitality ... water as resource, life source, gift and ancestor that narrates and directs «our passage

14. See www.mdba.gov.au/about-basin/basin-environment/challenges-issues

through the world and the world through us» (Nancy 2011: 83). This will involve thinking about water beyond the purely utilitarian paradigm in which it is currently framed. It means reading water through a different lens, to become water literate through “other-wise” knowledges, sensibilities and foci, such as those that First Nations people offer.

Some cultures revere water as a canonical text written by multiple authors: human and more-than-human. Could the «governments, corporate think tanks, [consumers] and multilateral agencies» of the developed world read water more broadly, and consider as Ariel Salleh (2008) does, «Why women [are] under-represented in climate change negotiations at local, national and international levels?»¹⁵ As ethnographic studies show world-wide, Indigenous and women (who have historically imprinted the smallest carbon footprint) have long been the guardians of water but were the first to become disenfranchised and remain under-represented in historical literature. Veronica Strang puts it squarely:

A historical analysis of water resource management [...] reveals a consistent pattern of lost agency and ownership [...] individuals have gone from sharing relatively equal involvement in the management of water through stages of disenfranchisement, first of women, and gradually the rest of the population. (Strang 2004: 36)

Decentering the dominant human, and identifying water as the fulcrum and interlocutor it is, seems timely yet challenging. How do we participate in broadening the outlook of policy makers and everyday citizen consumers? Cross-cultural water literacy that is cognizant of “other-wise” pedagogical agency, we argue, constitutes part of the solution. Perhaps as a means of contributing to the best adaptive practices and trans/resilience based policies, and attendant problematic human relations, The United Nations, through UNESCO declared 2013 as The International Year of Water Cooperation. While the language of the environmental humanities is not evident in UNESCO Director-General Irina Bokova’s launch speech, sincere intention and hope for better practice, is. She says:

We need new forms of water diplomacy – to integrate multiple perspectives and resolve problems in ways that are informed by science and technology and that favor inter-cultural dialogue¹⁶.

What underpins an understanding of international water diplomacy, equity, values and governance, is a fundamental respect for water, a reverence in fact, as Braun and Cavagnaro gently instructed in 1971, and in part, as Mangiameli reports from the Kasena people’s experience of water relations

15. Salleh (2008) raises sex/gendered/racial questions about Anthropocene accounting.

16. Irina Bokova speaking at the launch of The International Year of Water Diplomacy. www.unesco.org/new/en/media-services/single-view.

and the collapsing of nature-cultures into one sacralized entity with porous intangible borders. This is an example of cross-cultural water literacy at its best. Add gendered and Elder accounting to the equation and more productive solutions emerge.

To understand elemental reverence, several scholars and international inter-agencies have turned to First Nation People's for tutelage. Cross-cultural elemental literacy may offer a new spring of hope in resolving and sustaining the dynamic complexity and ongoing resilience needed in river systems and with associated actors, such as humans, and non-humans. In Australia this is evident in the far north of New South Wales, in an area called the Northern Rivers, where the local First Nation People, called the Widjabul, have entered into a cross-cultural and ecological dialogue with the local water authority Rous Water, using the rivers as the meeting place¹⁷. What is evident in this unique Australian example is a thorough bilingual and cross-cultural engagement with water, through the tripartite lens of cultural, ecological and economic value and capital, provided by indigenes and settler descendants – together. As Cram and Phillips (2012) suggest, research and governance through a «community-up» understanding of values constitutes best practice in cross-cultural policy making, increasingly evident in New Zealand/Aotearoa¹⁸. This figuration and implementation of values associated governance and connectivity provides the all-important referent for policy development as noted also by Groenfeldt and Schmidt (2013). Given that First Nation People's in Australia managed all resources without the extremes of western perturbation until 200 years ago (admittedly for a smaller population), it makes sense for everyday water users, policy makers and local governments to enlist Indigenous expertise, and to access, as is culturally appropriate, a very different pedagogy and ontology in which the respected tangible and intangible properties of water are understood. Implicit in Indigenous/First Nations pedagogy and ontology of water and being, is a version of Complex Adaptive Systems that we have argued is productively entangled with elemental literacy at the bio and geosocial level.

Conclusions

There is some hope in the recent advancement in governance and *g/local* agencies who exhibit a growing consciousness of Indigenous/First Nations values and approaches on which dynamic complexity and new and innovative governance and transboundary interaction relies. For example, Program Manager of the Aboriginal Water Initiative at the New South Wales Office of

17. See Hawke (2012) for an extensive discussion on this unique pedagogical exchange and other success that use the river as an interlocutor and arbiter.

18. See also Bradley Moggridge from The Aboriginal Water Initiative, NSW Office of Water, Department of Primary Industries. www.dpi.nsw.gov.au on Indigenous Water Values.

Water, Bradley Moggridge is actively engaged in “water yarning” and management that has positively affected government policy in Australia:

Governments have committed to include Indigenous representation in water planning; to incorporate Indigenous social, spiritual and customary objectives and strategies; and to take account of possible existence of native title rights to water in water resource planning and management (Maclean *et al.* 2012: viii).

The recent world-leading case of the Whanganui River Settlement in Aotearoa (New Zealand), receiving legal status as an entity, also reflects a sustainable and respectful bend in the river, a river that owns itself – is itself. Cognizance of the multiple values and meanings of natural and symbolic capital such as water, and application in practice requires thinking outside of western despair narratives and containment theories, for intact resilient and sustainable nature-culture futures to spawn water agency further. For the cultural imaginary to keep shifting in favour of water, a new criterion is required, to re-engage with water and its geosocial relations, to re-member water, to play with water, to make a love of water second nature, to develop sustainability pedagogy and policy, and read water differently in everyday life.

In 1971, Braun and Cavagnaro queried people’s loss of water consciousness, reverence and real life experience with the river. And so it has followed to some degree. Yet, re-incorporation of water in the public imagination via the methods discussed in this article, may enable a gentler hand on water’s co-present future down the complex adaptive stream and contribute to a new water logic that is more sustainable and geosocially underpinned.

Our intention in this article has been to draw on contributions to a new sustainability paradigm, through CAS, resilience and geosocial literacy, but not to foreclose that discussion. By utilizing tools of the past, to a new generative purpose that intersects with trans-disciplinary research into de-centring the human in the habitus, field and agency of water and its co-relations, this article has aimed to appraise the tangible and intangible authors of the waterscape. As Mangiameli suggests, «The world writes itself [...]» (2013: 145) but we would add, that it is a complex adaptive polymorphous text, in which water is an omniscient narrator.

Afterword

Recent studies suggest that melting ice sheets are changing the distribution of weight on Earth. As a result of this redistribution, it seems, the planet teeters in a new fashion on its polar axis (Adikhari, Ivins 2016). The planet’s water also falls and flows differently now. Rivers choke, pollutants overwhelm, and the rain that the hydrological cycle issues, is often acidic and ra-

radioactive and falling in different patterns and parts of the world, effecting food production and living practices worldwide as recent and ongoing events at Fukushima tragically demonstrates¹⁹. We rage at its absence and random abundance as the erratic partner it has become in all that we do. We expect it, yet often have too little regard for its wellbeing while demanding its support for our lives, this primordial witness to all becoming, and narrator of its own story, and ours; and we are only semi-literate.

19. <http://news.nationalgeographic.com/news/energy/2013/08/130807-fukushima-radioactive-water-leak/> (accessed on 22/09/2015).

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