

Trends in Aboriginal water ownership in New South Wales, Australia: The continuities between colonial and neoliberal forms of dispossession

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ABSTRACT

There is significant interest in global trends in Indigenous land titling but relatively less attention given to Indigenous water tenure despite significant reform of water governance regimes in many regions of the world. This paper considers the intertwined and complex history of Aboriginal land and water tenure in the Australian State of New South Wales, within the Murray-Darling Basin. Its temporal scope encompasses the initial dispossession effected by colonization and settler water development; the re-appropriation of land and water under social justice restoration schemes from the 1970s; and the past decade in which the small water holdings in the possession of some Aboriginal organizations have significantly diminished. The paper shows that proprietary rights to land and water acquired through the colonial period strongly conditioned rights of access to water during subsequent eras, particularly when Australian governments separated land and water titles and capped water use to create the world's biggest water market. Using empirical water entitlement data, we profile the composition, spatial distribution and value of Aboriginal water holdings in the NSW portion of the Murray-Darling Basin. We show that while Aboriginal people in this area constitute nearly 10 % of the total population, their organizations hold only 0.2 % of the available surface water. We identify changes in Aboriginal water holdings between 2009 and 2018 that are indicative of a new wave of dispossession. Almost one fifth of Aboriginal water holdings by volume were lost over 2009–18 (at least 17.2 % in standardized terms). We discuss the factors that render Aboriginal water-holders vulnerable to the loss of valuable water rights and those factors that constrain the ability of all Aboriginal people to fully enjoy the benefits of water access, including water market participation. Additionally, we identify critical omissions in Australian water rights reform and offer recommendations for redress that are of wider international relevance.

1. Introduction

Globally, many countries with significant Indigenous populations have been subject to colonial legal orders that confiscated and alienated Indigenous territories and undermined their decision-making powers (Borrows, 2015). Settler colonial states largely built their societies on an explicit denial of Indigenous property rights and rights to self-government (Altman, 2014; Nettheim et al., 2002). However, the resilience of Indigenous governance, the ongoing exercise of Indigenous authority over customary territories, and assertions of autonomy in matters relating to the environment and natural resource use has led to the implicit acknowledgment of those rights in recent decades, including rights to customary lands. The pursuit of claims to territory has been central to the work of the global Indigenous rights movement that emerged during the 1970s (Anthias and Radcliffe, 2015; Comtassel,

2012). International human rights standards now regard the right to land to be a primary factor in sustainable development for Indigenous peoples.

In response, states have established land claim and settlement processes to return lands to Indigenous peoples (albeit often diminished in size), recognized Indigenous peoples' absolute or shared rights to surface or subsurface use, and in some cases compensated Indigenous peoples for loss of territory. In Australia, for example, a land titling 'revolution' has resulted in Indigenous peoples regaining ownership and/or control to more than 30 % of the continent in the form of statutory land rights and native title (Altman and Markham, 2015). In Latin America too, states have extended new property rights regimes, transforming the way they recognize Indigenous rights and concomitant models of collective ownership (Blackman et al., 2017). Latin American states now recognize Indigenous and Afro-descendant tenure rights to

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some 200 million hectares of land (Bryan, 2012). Although the effects of restitution are spatially uneven, both between and within settler states, Indigenous peoples today manage or have tenure rights to over a quarter of the world's land surface (Garnett et al., 2018).

Analyses of trends in Indigenous land tenure reform and Indigenous titling show the effect of a range of mechanisms on the social institutions and conditions of dispossessed groups, and on patterns of land distribution (e.g. Anthias and Radcliffe, 2015; Auclair and Hamidi, 2010; Bryan, 2012). We know far less, however, about the effect of these mechanisms on Indigenous rights to water (surface water or groundwater) or the ways in which other global processes that are restructuring water rights are affecting Indigenous peoples. The relative lack of attention to Indigenous water rights may be partially explained by the fact that in many jurisdictions water rights have been regarded by states as a subsidiary component of land tenure rights, and in regions where water is plentiful there may be little need to regularize water tenure (Hodgson, 2004). Moreover, the policy, regulatory and administrative frameworks that once governed land and water together have often evolved in relative isolation from one another and followed separate paths (Hodgson, 2004; Woodhouse, 2012).

It is the aim of this paper to examine the complex interactions between Australian land and water rights regimes and the implications for historic and contemporary Aboriginal¹ water access in the country's most important agricultural region, the Murray-Darling Basin (MDB). The substance of land and water rights, and the manner in which they are allocated, clearly has major implications for their contemporary use and management, as well as the social and economic conditions of marginalized groups such as Indigenous peoples (Curley, 2019; Hodgson, 2004; Jackson, 2018a). Water's essential character means that the treatment of water rights should not be divorced from wider human rights considerations, particularly those pertaining to Indigenous rights (Robison et al., 2018). Indigenous struggles for water 'implicate a host of domestic laws, policies, and associated institutions pertinent to Indigenous Peoples' socioeconomic development, cultural identity, and political autonomy and external relations' (Robison et al., 2018: 845), and are therefore intertwined with rights to land and other resources. Both land and water tenure are important property rights that shape the contours of a region's political economy. For example, Womble et al. (2018) estimate that up to 236 Native American tribes have lands with unresolved groundwater claims in the Western U.S., where water supplies are increasingly strained and decisions over water allocation are highly contested (Bark et al., 2012; Robison et al., 2018).

There are further imperatives for understanding better the complex interactions between land and water tenures and the status of water rights in the context of Indigenous demands for territorial control and self-determination (Estes, 2019; Hemming et al., 2019). These imperatives stem from trends in water law and policy over the past two decades and from wider political economic changes in capital flows. First, states are asserting tighter control over water resources and establishing complex regulatory mechanisms to facilitate allocation of water rights (Burchi, 2012; Hodgson, 2004). Furthermore, in a number of countries and regions, states are privatizing and/or commodifying water and increasingly promoting marketization as a solution to an array of challenges that include water shortages (Debaere et al., 2014; Edwards, 2013; O'Donnell and Garrick, 2019). The Australian case is exemplary in this regard. Here, in the midst of major transformations to water governance that created new avenues to source, control, manage and trade water without secure title to land, new forms of Indigenous property have emerged. In response, knowledge about Aboriginal land

holdings has markedly improved (see Altman and Markham, 2015). By contrast, knowledge about Aboriginal water holdings (entitlements to extract water) has not (see Nikolakis et al. 2013). Negligible attention has been given to the far-reaching effects of the world's biggest water market on Aboriginal water holdings and wider questions about Aboriginal water access have only recently garnered interest from policymakers (Jackson et al., 2019; Macpherson, 2019; McAvoy, 2008; Tan and Jackson, 2013; Taylor et al., 2016).

Second, water is both a target and driver of the global rush by transnational actors to acquire land as sources of alternative energy, crops, and environmental services (Mehta et al., 2012). Scholarship on the phenomenon known as 'land grabbing' has examined the political and socio-ecological effects on the world's most vulnerable, including Indigenous peoples (Adams et al., 2019; Mehta et al., 2012). The term 'grabbing' highlights the similarities with historical processes of enclosure and dispossession, including those shaped by colonization. Policy and academic interest has tended to focus on the acquisition of large-land holdings, overlooking the appropriation of water resources to sustain profitable land uses and the effects on existing water users and ecosystems. Mehta et al. (2012) explain that water is often ignored in land grab literature because of its material properties (the multiplicity of forms it takes throughout the hydrological cycle and scales through which it moves) and the 'slippery' nature of appropriation processes, involving *inter alia* insecure or undefined water rights and dis-jointed regulatory regimes.

The dearth of reliable data on Indigenous peoples' water rights has implications for securing Indigenous rights, especially in the face of continually expanding demands for water and restructuring of water rights regimes (Boelens et al., 2007; Jackson, 2018a; Macpherson, 2017). Nowhere do Indigenous peoples start from a strong legal base in their struggles for water rights. States rarely recognize customary systems of regulating and managing water access in legislation and policies that govern water distribution or in development decisions (Jackson, 2018a). In fact, states often legally and materially discriminate against Indigenous peoples (Boelens, 2009; Burchi, 2012).

Water allocation regimes are strongly conditioned by historical rights of access and usage patterns (very often tied to land tenure) that did not recognize or respect Indigenous water rights or, if they were acknowledged, they were narrowly defined (Burchi, 2012). Allocation regimes designed to meet the needs of colonial societies in the USA, Canada, Australia, Chile and New Zealand, for example, have excluded Indigenous peoples and prioritized the interests and water needs of white settler communities (Berry et al., 2017; Curley, 2019; Estes, 2019; Jackson, 2018a; Tarlock, 2010). In the western USA, Indian water rights were designed to fulfil the colonial purpose of reservations rather than to address injustices of theft and appropriation, or to recognize inherent customary water rights (Curley, 2019). In Chile, 'It has proven ... difficult for Atacameños to gain legal recognition of ownership over water sources in the expansive indigenous territories associated with customary pastoral movement' (Babidge, 2016: 89). Outstanding and newly articulated water rights claims from Indigenous peoples therefore present clear equity challenges to today's water allocation systems (see Bark et al., 2012; Budds, 2009; Curley, 2019; Jackson et al., 2019; Trawick, 2003; Womble et al., 2018).

In this paper, we make four contributions. First, we provide the first history of water rights acquisition by Aboriginal organizations in any Australian jurisdiction, specifically in the New South Wales (NSW) portion of the MDB. By reconstructing the history of land and water rights restitution schemes we show how Aboriginal communities entered the neoliberal era in a relatively weak position. In the 1990s, governments restructured water rights to create secure, tradeable entitlements to water that they granted to existing rights holders, and few of these were Aboriginal. Second, we generate a profile of the composition, spatial distribution and value of contemporary (2018) Aboriginal water holdings in the case study area. In doing so, we establish the first baseline of Aboriginal water holdings that is consistent with new water accounting

¹ Indigenous representatives active in water policy reform refer to themselves as Aboriginal peoples and utilize the term 'Nation' or 'First Nations' to refer to the Aboriginal groups in the Basin. In the interests of uniformity, we utilize these same terms here except where national programs that encompass the interests of Torres Strait Islanders. In such cases, we use the term 'Indigenous'.

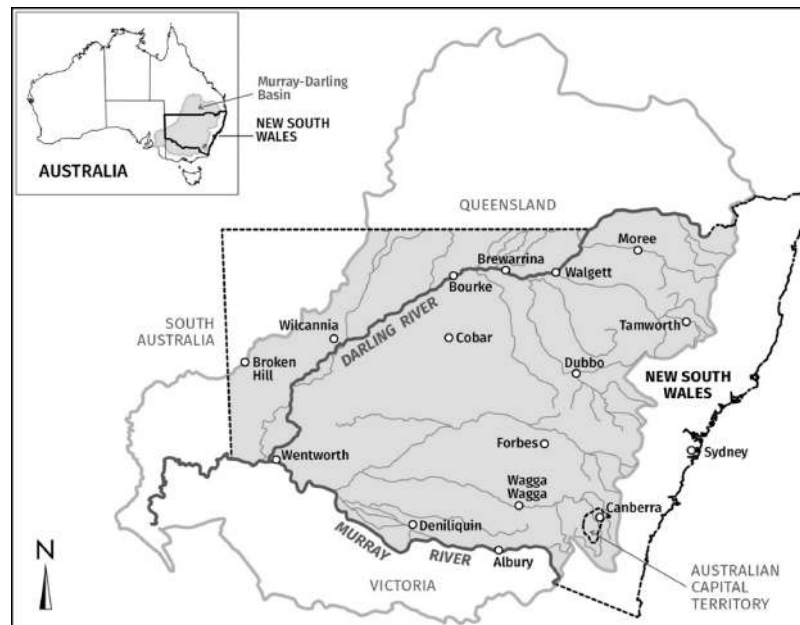


Fig. 1. Map of Murray-Darling Basin showing NSW portion shaded.

regimes in the Basin, introduced to monitor water consumption and instill transparency in water trading. Third, we quantify changes to Aboriginal water holdings over a ten-year period (2009–2018). From this analysis, we identify and discuss the factors that render Aboriginal water holders vulnerable to losing their water rights, as well as the factors that prevent all Aboriginal people from enjoying the benefits of water access, including water market participation. Fourth, we identify critical omissions in water rights reform, notably an absence of strong policy measures designed to advance Aboriginal water rights and stem future losses, and ongoing institutional gaps in land tenure and water resource management. In the following section, we introduce our case study context and methodology.

2. Methodology

2.1. Case study area: the NSW portion of the MDB

The MDB occupies one seventh of the Australian continent (1.06 million km²) and drains waters from four States (NSW, Victoria, Queensland and South Australia) and the Australian Capital Territory (see Fig. 1). The MDB contains important groundwater systems and more than 20 major rivers linking 23 catchments, and 30,000 contiguous wetlands, most of which are dependent on water for which there is intense competition from agricultural production (Alexandra, 2018). The Basin supports approximately 40 % of the total gross value of Australia's agricultural production, including 46 % (A\$7 billion) of the gross value of irrigated agriculture (Productivity Commission, 2018), making it Australia's most productive agricultural region. Irrigated agriculture in the Basin typically accounts for approximately 70 % of Australia's water diversions and is responsible for ~90 % of the water consumed in the Basin (Grafton and Wheeler, 2018), although these irrigation activities cover less than 2 % of the Basin's land mass (Murray-Darling Basin Authority MDBA, 2016).

The MDB encompasses the territories of more than 40 autonomous Aboriginal Nations that comprise approximately 15 % of Australia's Aboriginal and Torres Strait Islander population (Robison et al., 2018). The development of the Basin has left Aboriginal Nations in possession of less than 1% of its land base, representing a higher level of dispossession than many other Australian regions (Arthur, 2010). In 2016, the Aboriginal population was 5.4 % of the MDB total population,

having nearly doubled since 2001 (ABS, 2017, 2018; MDBA, 2017).

Three-quarters of the State of NSW lies within the MDB (MDBA, 2020), constituting approximately 56 % of the MDB by area (Australian Bureau of Statistics ABS, 2008). We selected the NSW portion of the MDB as a study site for the following reasons. Of the State and Territory jurisdictions that overlap with the MDB, the NSW portion has the largest share of the Basin's Aboriginal population (65.1 %) and largest total population (37.4 %) (ABS, 2017, 2018; MDBA, 2017). NSW diverts the largest amount of surface water (Haisman, 2005), and the Basin's water trade involves a significant number of water entitlements issued by NSW (ABARES, 2018). Additionally, 75 % of known licenses held by Indigenous organizations across Australia were identified within NSW in a 2009 study (Altman and Arthur, 2009), most of which appear to exist within the MDB.

Wheeler et al. (2014a) explain the entitlement system in the MDB, noting that the water allocation system of each State² generally defines pools of water available for consumptive use and allocates water to entitlement owners. Every water season (July to June), water is allocated as a percentage of water entitlements based on the water availability within storages, expected inflows and other factors. Water entitlements exist in both regulated systems (predominantly in the south where flows are controlled through infrastructure that stores and releases water) and unregulated systems (where water use is far less controlled by infrastructure). Regulated water entitlements have different levels of reliability (classified as high and general security in NSW), while entitlements in unregulated systems generally have no formal reliability (Wheeler et al., 2014a). The total value of the water market within the Basin was A\$16.5 billion in 2015–16 (ABARES, 2018).

2.2. Methods

A number of methods were used to obtain the data that forms the basis of this paper.³ We established the history of land and water rights acquisition from published literature on Aboriginal land claims

² Under the Australian Constitution, States and Territories are responsible for water management, including allocation planning and regulation.

³ Data collected and analyzed in this paper are based on doctoral research conducted by L.D. Hartwig. See Hartwig (2020) for a detailed account of the methods presented here, including the standardization process.

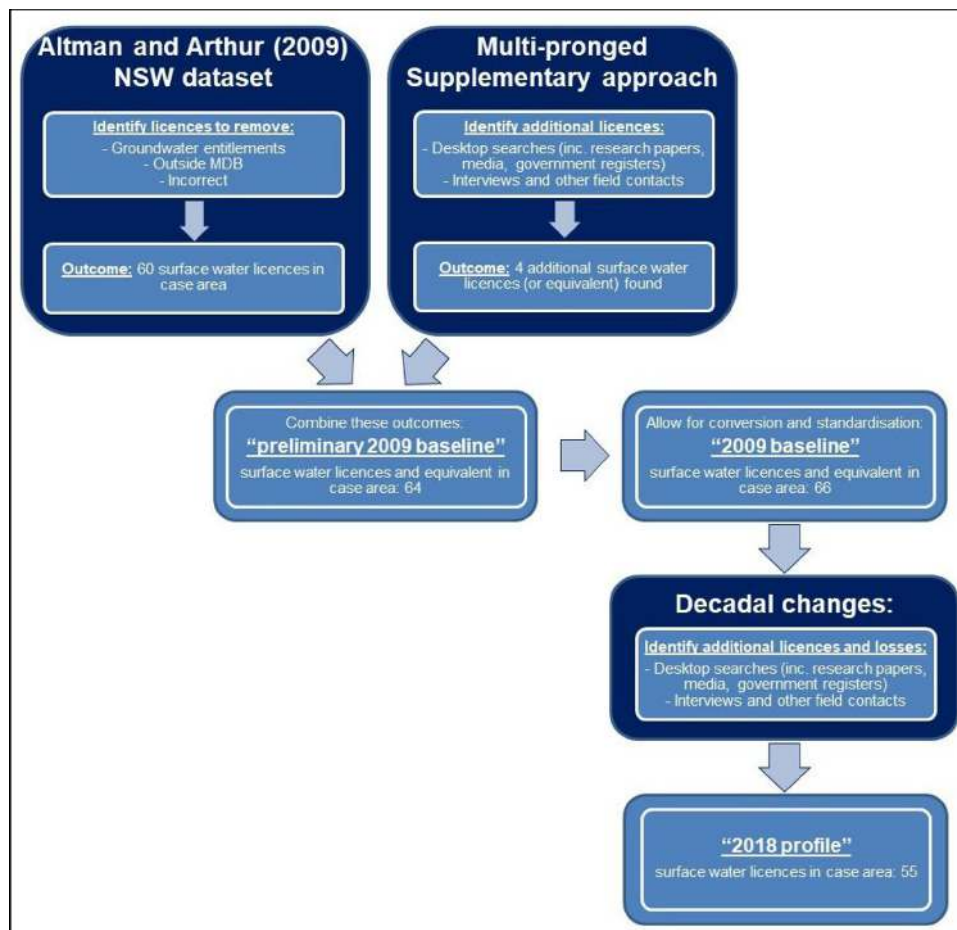


Fig. 2. Methods for developing the 2009 baseline and 2018 Aboriginal water holdings profile.

processes. Aided by water register searches, we also revisited a dataset of water holdings built by Altman and Arthur (2009) (Australia's first count of Aboriginal water holdings) to develop a 2009 baseline which we used as a benchmark to (i) describe the composition of current holdings (as at October 2018) and (ii) analyze the change in holdings over the period 2009–18. We focused on water held by Aboriginal organizations and entities, referred to here as 'Aboriginal holdings' or 'Aboriginal-held water' because data on the water holdings of individuals identifying as Indigenous is not readily available (see Altman and Arthur, 2009). We visually represent the approach taken to develop the 2009 baseline and 2018 Aboriginal water holdings profile in Fig. 2.

Interviews with Aboriginal water holders during 2017–2018 (to be analyzed in future publications) informed and verified both our analysis of Aboriginal water holdings (see Fig. 2) and our history of land and water rights acquisition. All interviews (25 with representatives from 13 Aboriginal organizations) were undertaken in accordance with the Human Ethics protocol of Griffith University. As a further verification step for developing the 2009 and 2018 baselines, we manually checked other sources, including websites, news articles and information held by the Office of the Registrar of Indigenous Corporations. Population figures reported throughout this paper draw from most recent estimated residential population (ERP) data (ABS, 2017; 2018).

We chose 2009 as our baseline because it was consistent with Altman and Arthur's 2009 study; however, it presents an accounting difficulty. At that time, the NSW Government's staged water reforms were only partially complete. Under NSW's former water law (*Water Act 1912*), the government regulated access through numerous water rights and entitlement mechanisms. When the law was changed in 2000 (*Water Management Act 2000*), all these mechanisms were to be

converted under a staged process into a standardized form called 'Water Access Licences' (WALs), with several categories and subcategories. While the government had converted most water access mechanisms across our case study area by 2009, it was not until October 2012 that the conversion was complete (MDBA Independent Audit Group, 2012).

In some instances, this conversion process also involved quantifying water access for the first time. The extractable water volume of these newly issued WALs was calculated based on water use history (NSW Department of Industry, 2018a). Therefore, our 2009 baseline includes some water rights that were only converted (and in some cases quantified) in 2012. This step is possible because the 2012 entitlements reflect equivalent water rights held in 2009.

Our 2018 profile (determined as at October 2018) is the first to be compatible with current Basin water accounting methods, and thus offers an important benchmark for future monitoring.⁴ Water entitlements within and across catchments yield different average water volumes for their holders, making comparison within the Basin difficult. We followed the approach of the Murray-Darling Basin Authority (MDBA hereafter) and Basin States to estimate 'long-term diversion limit equivalence' for Aboriginal water holdings, which we call 'standardized' volumes, and denote with a subscript 's' on volumetric measures (e.g. ML_s or GL_s).⁵ Applying this method better reflects actually available and used water volumes, which are usually less (sometimes significantly so) than on-paper entitlement volumes (Wentworth Group of Concerned Scientists, 2010). It also enables comparison of different

⁴ The complete list of holdings that comprise the 2018 profile is available in Hartwig (2020).

⁵ A gigalitre (GL) is a thousand million litres or 1000 megalitres (ML).

entitlements both within and across valleys on equal terms (NSW Department of Industry, 2018b).

Some impacts to Aboriginal-held water entitlements that we track in the decade under study occurred prior to conversion under NSW's staged water reform process (i.e. between 2009 and 2012). As the above-described standardization method is only applicable after water access mechanisms are converted, we are unable to quantify these pre-conversion alterations in a consistent and standardized way. The Aboriginal water holdings loss between 2009 and 2018 that we report is, therefore, a conservative estimate.

3. Historical trends in Aboriginal water dispossession and repossession in NSW

In this section, we examine colonial systems of water resource governance and development, describing the mechanisms and key moments in the process of water dispossession. We define water dispossession as loss of access to and control of the use, management and custodianship of water. We then trace processes of water repossession or re-appropriation, where Aboriginal peoples regain access or control, albeit under different forms of governance and under relations of power that remain asymmetrical. This phase commenced in the case study site in the 1970s and is ongoing. Given that land and water titles were inseparable (or appurtenant) until the end of the twentieth century, this review must necessarily look at changes in water tenure effected through historical water and land regulation laws and policies.

3.1. The imposition of colonial water governance and Crown control of water (1770s to 1970s)

Prior to British occupation, there were multiple and varied land title systems across the continent and islands of what is now called Australia (Tehan, 2010). The British did not recognize or seek to protect these customary systems, relating to either land or water, and they did not enter into formal treaties with Indigenous peoples. The process of settlement and the grant of land to settlers – with no regard for Indigenous land holding systems – began the process of dispossession (Tehan, 2010). During the colonial period, much of Australia's wealth was built on exploiting water resources for mining, urban water supply and later irrigated agriculture (Harris, 2007). Colonization in the agriculturally promising southeast corner of the Australian continent, which was probably the most densely populated part of Aboriginal Australia, 'was arguably the most rapid and most catastrophic colonial dispossession of the nineteenth century' (Smith et al., 2008: 536). Expansion of pastoral settlement along waterways placed intense pressure on Aboriginal land uses, radically altering the country, and competition for land and especially water precipitated conflict. It is in this region that some of Australia's worst episodes of frontier bloodshed greatly reduced the Aboriginal population (Clarke, 2009), as did disease and territorial dispossession.

Australian colonies adhered to common law riparianism as the basis of water law for at least a century (Harris, 2007). Based on English common law, riparianism gave rights to use water from streams and rivers to the adjacent (riparian) landholders, predominantly graziers. As landless people, Aboriginal communities were not entitled to exercise common law riparian rights, whereas white riparian landowners enjoyed the security of 'reasonable use' of water, as well as substantial government subsidies to build farming and grazing economies (Berry and Jackson, 2018). From the late 1800s and early 1900s, colonial governments conferred upon the Crown direct control over water resources in order to stimulate agricultural expansion and encourage closer settlement (Haisman, 2005).

This shift in water governance allowed each of the colonies (later, States) to establish centralized water governance systems, administered and closely controlled by public authorities (National Water Commission NWC, 2011). The period from 1918 to the 1970s saw

significant expansion and government investment in irrigation activities and river regulation, including construction of large dams, and many weirs and locks across the MDB. During this time, State government authorities allocated water through statutory licensing application systems where potential users applied for water entitlements with minimal charges, and authorities rarely refused requests (National Water Commission NWC, 2011). The tradeable water access entitlements brought into existence in the late twentieth century were based on these initial licenses and permits to take water (National Water Commission NWC, 2011).

Over the course of the nineteenth century and up until the mid-twentieth century, colonial authorities relocated ever-larger numbers of Indigenous people to managed institutions where they were subject to government intentions to protect, control and later to assimilate. Reserves, missions and stations were progressively set aside for exclusive Aboriginal use in NSW from the 1850s (Goodall, 1996).⁶ One of the main stated purposes of Aboriginal Reserves was farming and agricultural activities (some of which required water), which in part were intended to facilitate self-sufficiency within a larger assimilation agenda (Goodall, 1996). Over many decades and well into the late 20th century, the NSW Government revoked many of these Reserves, often in response to demands from covetous white landowners (Goodall, 1996; Norman, 2015). Between 1909 and 1969, revocations totaled 15,000 ha (Norman, 2015).⁷ We return to the significance of this in the coming section, but the point here is that, 'Indigenous groups who typically did not hold Torrens (registered) land titles, did not enjoy access to statutory water entitlements, and could not, therefore, lawfully make use of water on or adjacent to their traditional territories' (O'Neill et al. 2016: 407).

Settlement, containment, regulation and assimilation processes greatly diminished the capacity of Aboriginal peoples to manage and utilize their land and waterscapes, with profound effects on peoples' abilities to maintain language, knowledge of environments and cultural landscapes, and to adhere to customary tenure institutions. Through these processes, many Aboriginal people were relegated to the fringes of expanding rural towns and dispersed camps where they were further ostracized. Although vulnerable to discrimination and marginalization in the rural economy, they nonetheless consistently asserted ownership over their territories (Goodall, 1996; Forsyth and Gavanovic, 2018).

3.2. The land titling era (1970s to today)

Australian governments did not institute restitution processes until the 1960s, when some jurisdictions responded to the social movement for greater recognition of Indigenous rights and changed their framework for regulating rights in land. New types of corporate ownership of property based on rights of prior occupation and wider shifts in land and natural resource management responsibilities established a degree of Indigenous autonomy in land and environmental matters (Altman and Jackson, 2014; Altman and Kerins, 2012). Since the landmark legislation applying to South Australia (in 1966) and the Northern Territory (in 1976), Indigenous rights to land have been introduced to State parliaments in all jurisdictions except Western Australia and the ACT (Altman and Markham, 2015). Before discussing how compensatory land rights mechanisms were implemented in NSW – and their

⁶ In Australia's colonial history, a Reserve served as a place for the exclusive occupation by native tribes carved out and overseen by governments to secure territory, as well as to manage Indigenous peoples. Colonial authorities intended Reserves to be of use and benefit to Indigenous people, but those authorities still paternalistically determined this use (Jackson, 2017b). Their declaration did not entail the grant of any rights to land to Aboriginal people.

⁷ These revocations were later found to be illegal. In 1983, controversial legislation retrospectively legalized these illegitimate land resumptions alongside the introduction of the NSW *Aboriginal Land Rights Act* 1983. See Norman (2015) for further discussion and analysis.

implications for Aboriginal water re-appropriation – it is necessary to describe the wide-ranging changes that affected water regulation and access during this era.

Around the late 1970s, Australia's mode of water governance changed significantly, shifting from a paradigm of 'development' to 'management' which saw a new focus on water use efficiency (Edwards, 2013). As water demands in the MDB began to exceed average supply, some jurisdictions placed embargoes on issuing new licenses (National Water Commission NWC, 2011) and began reforming water rights and introducing new forms of water property, amongst other changes characteristic of neoliberal resource policy (Edwards, 2013). Interest in markets as a means of allocating water more efficiently also consolidated, and by the 1990s water trade began in earnest (Grafton et al., 2011). These reforms marketized pre-1990s water rights to the benefit of predominantly non-Indigenous landowners. However, some Indigenous organizations also entered this water reform era with grandfathered water holdings. As we detail below, these were acquired with redistributed land titles, but only in certain situations. Moreover, these water reforms 'closed' water resources to new access entitlements under a series of actions at the State level with embargoes in the 1980s and at the Basin level, in 1997, when governments capped water diversions at 1993–94 levels. No consideration was given to the effect of these closures on Indigenous peoples (Jackson, 2017a). We now return to the means by which Aboriginal peoples obtained land and water rights in NSW.

3.2.1. Land rights law, NSW

The NSW Government introduced the *Aboriginal Land Rights Act* (ALRA) in 1983. The underlying reason for the enactment of the ALRA was 'the necessity to provide Aboriginal people with economic independence as well as providing compensation for past injustice' (Behrendt, 2011: 811). The legislation established a process for determining claims, transferring land (which sometimes included water titles or other assets) to newly established Aboriginal Land Councils, and for supporting these Land Councils to purchase land. Between its introduction and mid-2014, the ALRA enabled close to 2,500 successful land claims (approximately 127,000 ha) (Norman, 2017).⁸ This represents only about 0.15 % of the whole State, or 0.4 % of the State's Crown estate (Norman, 2017), and compares poorly with the size of Indigenous holdings returned under some other statutory land rights schemes (Behrendt, 2011). The relatively modest amount is a direct result of the limited definition of 'claimable Crown land' (discussed below), as well as administrative delays associated with the claims process (see Behrendt, 2011; Chalk and Brennan, 2015; Norman, 2015).

The ALRA does not include any explicit water rights provisions, but its mechanisms have enabled some Aboriginal organizations to acquire water. When the ALRA was enacted, it provided for the automatic transfer of land that was at the time being administered by the Aboriginal Land Trust, much of it former Reserve land, to Aboriginal Land Councils (Norman, 2015). As mentioned above, these historical Reserves served as key agricultural bases, and some included access rights to water. Our analysis shows that these transfers of Reserve land usually included water licenses permitting stock and domestic uses, and sometimes farming. However, the Reserves transferred in 1983 constituted less than a quarter of the land that NSW had historically reserved for Aboriginal peoples. Goodall (1996: 125) describes this as an extreme and controversial 'relentless second dispossession'. We emphasize that it not only robbed Aboriginal peoples of land and the ability to maintain connection with customary estates – it also foreclosed a crucial, albeit constrained, pathway to water access and ownership that had opened up in the 1970s.

The ALRA land claims process also offers limited opportunity to

improve water access. According to section 36 of the Act, only vacant, unused Crown land is claimable. These are lands that 'are not needed, nor likely to be needed' as residential lands or essential public purposes and 'not lawfully used or occupied' (section 36(1), ALRA). Following this definition, Macdonald (1988: 39) concluded that claimable land was likely to be 'land no-one else wants' and, due to the extent of development in NSW, unlikely to sustain profitable uses (such as irrigation) either. The essentially vacant and unused (and largely unproductive) character of claimable land starkly contrasts with the type of land to which water entitlements were attached to (i.e. land under cultivation). Thus, land claimed through the ALRA from the mid-1980s was very unlikely to have yielded any licensed water access. Perhaps most significantly, from 1982, the NSW Government progressively introduced embargoes on new water licenses in regulated systems to reduce environmental pressure on water resources. As this was a year before the ALRA came into effect, it further precluded opportunities for Land Councils to simply apply for water licenses to use on claimed land, as non-Aboriginal landholders had so routinely done in the past.

3.2.2. Property purchases

The second major avenue through which Aboriginal organizations have acquired water licenses is the Aboriginal land acquisition schemes of State and Federal Governments. Lands selected for purchase were targeted, at least in part if not completely, due to their cultural and social significance (Altman and Pollack, 1998; Macdonald, 2004; Norman, 2015; Palmer, 1988). Property purchases could have offered an effective means for acquiring more water entitlements because land available for purchase may have come with water licenses, but this potential has been constrained for several reasons. We describe only a few reasons relating to the NSW case.

Aware of the limitations of the ALRA land claims process, the NSW Government introduced a financial compensation package to facilitate land purchases by Land Councils through the open market (Norman, 2015). In some western and central-southern areas of the State, Regional Land Councils pooled their compensation funds to purchase large and valuable commercial properties, often with river frontage, agricultural equipment and/or stock (Cook and Goodall, 2013; Norman, 2015). Our analysis reveals that several of these purchases also included significant water entitlements. With this strategy, Land Councils intended to build strong land bases at the local community level, serving multiple related social, cultural and economic objectives (Macdonald, 2004; Norman, 2015). However, extensive amendments to the ALRA in 1990, and subsequent tensions between Land Councils and the NSW Government, as well as across Land Councils, stalled these strategic land acquisitions (Macdonald, 2004; Norman, 2015).

Alongside this State-based scheme, the Federal Government has run compensation schemes to purchase land on behalf of Aboriginal people over the past 40-plus years through a number of agencies and programs. While each iteration had slightly different objectives, and faced obstacles and constraints detailed elsewhere (see, for example, Altman and Pollack, 1998), these schemes represented a potential means to boost Aboriginal water holdings. Consistent with the NSW regime, whether properties purchased via Federal regimes included water access was determined by the prior use and history of the property – primarily whether previous landholders had applied for water entitlements.

The Aboriginal Land Fund Commission (1975–1980) and its successor the Aboriginal Development Commission (1980–1990) together purchased 148 properties across Australia (Aboriginal Development Commission, 1990). Our research finds at least⁹ five of these included water entitlements within the case study area. Then, between 1990 and

⁸ As at 30 June 2018, though, around 33,452 claims remained undetermined (NSWALC, 2018).

⁹ Exact details are difficult to provide as Aboriginal Development Commission's Annual Reports did not include comprehensive property acquisition lists after 1985/86 nor list specific water access details.

1995, the Aboriginal and Torres Strait Islander Commission (ATSIC) oversaw several land acquisition and management programs (Altman and Pollack, 1998), which saw additional properties purchased with water licenses attached. Most recently from mid-1995, similar property purchases occurred through the Indigenous Land Corporation (ILC).¹⁰ The ILC and its accompanying Indigenous Land Fund formed part of the Federal Government's response to the 1992 *Mabo* High Court decision on native title (see below) and provides a mechanism to return customary lands to Indigenous peoples unable to prove ongoing connections to customary estates through the courts (Altman and Pollack, 1998).

3.2.3. Native title

Following the *Mabo* High Court decision of 1992, Australian courts recognize that there were legal systems in place prior to European occupation, that Indigenous peoples' rights to land survived colonization, and that a form of native title can exist where it has not been extinguished. The law of native title now commonly recognizes Indigenous rights to take and use waters for personal, social, domestic, and cultural purposes without the need for a license, where evidence of traditional law and custom is proved¹¹ (O'Bryan, 2019; Tan and Jackson, 2013). The *Native Title Act 1993* (Cth) confirms the Crown's right to use and control the flow of water (including to issue licenses to take and use water) and gives statutory protection to water licenses granted to non-Aboriginal landholders prior to 1975, the date at which the Commonwealth's *Racial Discrimination Act* took effect. It also validates types of past actions of government that extinguished native title and provides compensation for some acts where native title has been extinguished. According to O'Donnell (2013), compensation does not automatically follow the grant of a license to take water. A feature of the legal framework that is of particular relevance to this paper is that native title rights to take and use water do not allow commercial water use, nor confer exclusive ownership of water (O'Donnell, 2013).

One-third of the Basin is subject to native title application (Arthur, 2010). While there have been successful native title determinations including recognition of water rights and interests in the case study area, they have resulted in only limited rights of consultation (see Hartwig et al., 2018). Commentators have noted that the *Native Title Act* denies native title holders a commercial negotiation opportunity because their procedural rights concerning new water resource development are so limited (Jackson and Langton, 2012; O'Bryan, 2019). Native title holders are granted only a procedural right of notification and an opportunity to comment prior to the grant of any license to take water (O'Donnell, 2013). The grant of a license to take water does not, as a matter of law, extinguish native title but rather it is effectively totally suspended during the term of the license (O'Donnell, 2013).

3.2.4. Water law, NSW

NSW's water law, the *Water Management Act* (2000), established a mechanism by which Aboriginal people could apply for water under special licenses. As noted by Tan and Jackson (2013), NSW introduced four types of specific purpose licenses for Indigenous interests:

- a) Aboriginal cultural access licenses;
- b) Aboriginal commercial licenses;
- c) Aboriginal community development licenses; and
- d) Aboriginal environment licenses.

Various restrictions accompany each license (e.g. the cultural access

¹⁰ Renamed the Indigenous Land & Sea Corporation (ILSC) in late 2018.

¹¹ Under NSW water law, the requirements of native title holders for water (e.g. for ceremonies, teaching of traditional laws and practices such as fishing etc.) are given similar priority to stock and domestic rights and are therefore to be met prior to any other consumptive water uses (Hartwig et al., 2018).

license is generally capped at 10 ML and cannot be traded). None of these license types have been popular, indeed only a handful have been allocated, and their shortcomings are noted elsewhere (see Jackson and Langton, 2012; Tan and Jackson, 2013). The most relevant point for this study is that Aboriginal commercial and community development licenses are not available in the MDB portion of NSW.

In summary, Aboriginal people came into the water market era with limited water holdings because for over two hundred years their eligibility to hold water licenses was severely curtailed by structures and processes that first precluded ownership of land and then, more recently, tightly prescribed their access to irrigable land. Initially, British occupation dispossessed most Aboriginal peoples of their land and the water rights attached to land under colonial laws. Then, restrictive land restitution processes introduced two hundred years after colonization limited the amount of irrigable land (with water licenses attached) available for claim by Aboriginal people. The moment when Australian society acted to redress colonial dispossession and recognized Indigenous native title rights (rights to land and water) coincided with major restructuring of water access that entailed the separation of land and water titles and establishment of water markets. At this critical juncture in water governance reform, governments exacerbated the inequitable pattern of water rights distribution that they had inherited from the colonial era by grandfathering water rights to then existing rights-holders (Haisman, 2005), and by closing key water resources in the Basin to establish a water market and restore waterways. Native title and specific purpose license mechanisms established under revised water legislation have so far offered no meaningful means of redistributing water use rights, providing instead mere consultation and tokenistic protection of 'cultural values' (Jackson and Langton, 2012; Tan and Jackson, 2013). Indeed, this is the inherent weakness of such recognition policies (Hartwig et al., 2018). The constellation of these circumstances has strongly shaped current patterns of Aboriginal water access such that the water market is now the only option for Aboriginal people to secure water entitlements that are equivalent to those held by other water users (Jackson et al., 2019; Productivity Commission, 2017).

4. Water rights appropriation in the neoliberal era

Neoliberalism has had a significant effect on water and natural resource management in Australia (Higgins, 2014), the most obvious instantiation being the creation and proliferation of water markets by the state (Edwards, 2013). Thus far, this paper has established how and why Aboriginal people entered this era of water trading in the MDB with extremely limited water rights. In this section we quantify Aboriginal water holdings as at October 2018 and discuss the multi-dimensional nature of disparity in contemporary water access. We also show how Aboriginal water holdings have changed over the past decade and discuss the causes of a significant decline.

4.1. Profile of Aboriginal water holdings in NSW

In 2018, Aboriginal water holdings comprised 55 water entitlements to 12.1 GL_s held by 25 Aboriginal organizations. Fig. 3 demonstrates the geographic distribution of these water holdings, with standardized volumes and relative proportions presented for each of the 10 catchments in the case study area. We estimate these holdings are valued at approximately A\$16.5 million, or about 0.1 % of the value of the water market in 2015 – 16 terms (ABARES 2018). The largest Aboriginal-held volume is within the NSW Murray catchment (4,225 ML_s), closely followed by the Murrumbidgee catchment (4,071 ML_s). However, as long-term water extractions are greatest in these two catchments (1,680 GL_s, and 2,117 GL_s respectively), these holdings only constitute 0.25 % and 0.19 % of total water available in each catchment. The catchment with the largest proportion of water held by Aboriginal organizations is the

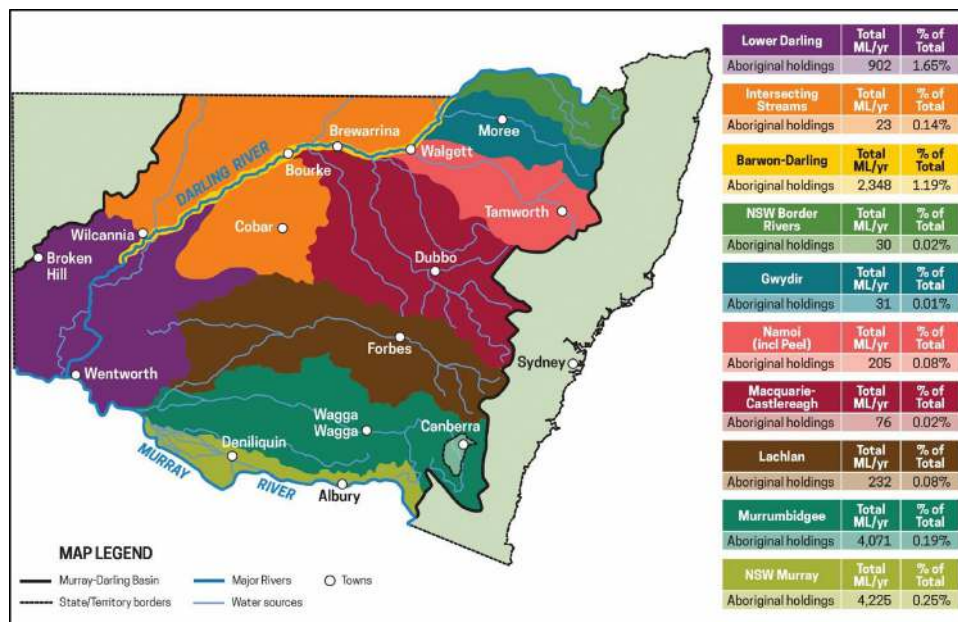


Fig. 3. Aboriginal organizations’ standardized water holdings per catchment in the NSW portion of the MDB (as at October 2018). Catchments are defined as Surface Water Sustainable Diversion Limit Resource Units (see MBDA, 2017).

Table 1
Key distribution statistics of population, water availability and Aboriginal holdings in the NSW portion of the MDB.

	North		South ^C		Total
	Number	Percent	Number	Percent	
Total water ^A (ML _s)	1,327,557	24.3 %	4,137,394	75.7 %	5,464,951
Aboriginal-held water ^A (ML _s)	2,714	22.3 %	9,430	77.7 %	12,144
Aboriginal-held water as a proportion of total water (2018)	–	0.20 %	–	0.23 %	0.22 %
Total population ^B	371,060	44.1 %	470,311	55.9 %	841,371
Aboriginal population ^B	49,829	63.5 %	28,649	36.5 %	78,478
Aboriginal population as a proportion of total population (2016)	–	13.4 %	–	6.1 %	9.3 %

Notes: ^A 2018 NSW water entitlement data, long-term average annual yield compiled using method detailed in Hartwig (2020). ^B Population statistics are based on custom calculations of Estimated Residential Populations by Dr Francis Markham from ABS (2017, 2018), and MBDA (2017). ^C South includes Lachlan, Lower Darling, Murrumbidgee and NSW Murray Surface Water Sustainable Diversion Limit Resource Units, aligning with the common northern-southern Basin divide.

Lower Darling (1.65 % or 902 ML_s) and the smallest is the Gwydir (0.01 % or 31 ML_s).

We compared this distribution of 2018 water holdings with Aboriginal population data to reveal inequities in water holdings at two scales. First, accumulated across the case study scale, Aboriginal peoples represent 9.3 % of the total population but by comparison, Aboriginal entities hold a mere 0.2 % of the available surface water (total long-term average). For comparison, we note that Australian governments had recovered 18.8 % for environmental purposes in this area by 31 December 2017 (NSW Department of Industry, 2018a, 2018b).

At the second scale, we compared the distribution of Aboriginal-held water with the distribution of the Aboriginal population across the north and south of the NSW-portion of the MDB in Table 1. Such a comparison is significant given that the MDB is often separated into northern and southern sub-basins for management purposes (see Wheeler and Garrick, 2020). Contrasting the water rights and population distributions enables one to appreciate better the degree of under-representation of Aboriginal water rights. In particular, in the northern NSW-portion of the MDB, Indigenous peoples constitute a larger proportion of the total population (13.4 %, compared to 6.1 % in the south) and of the total NSW-MDB Aboriginal population (63.5 %, compared to 36.5 % in the south). Yet, Aboriginal entities in the north hold a smaller

fraction of available water (0.20 %, compared to 0.23 % in the south). The fact that water entitlements in the north are generally of lower market value compared to in the south (ABARES, 2018) further compounds this under-representation.

The entitlement type is a major determinant of the economic value of water holdings, with those of higher security being the most valuable. Fig. 4 shows the entitlement types held by Aboriginal organizations, using standardized volumes. This shows 79 % of water held by Aboriginal entities is found in regulated systems while 21 % is found in unregulated systems. Fig. 4 shows that only 2.4 % of water held by Aboriginal entities is of high reliability (i.e. High Security or A-Class entitlements – bold-type and underlined in Fig. 4). In other words, the vast majority of Aboriginal organizations receive little benefit from the comparatively greater reliability and certainty of access of these licenses. Literature shows that license reliability affects how license holders use and benefit from their water entitlements (Peel et al., 2016; Wheeler et al., 2014b). Therefore, the generally lower reliability of Aboriginal organizations’ water holdings is likely to affect how they use and benefit from water, and therefore reduce the ability for longer-term planning associated with water use. This finding adds a further layer of complexity and another dimension to the disparity in Aboriginal water access.

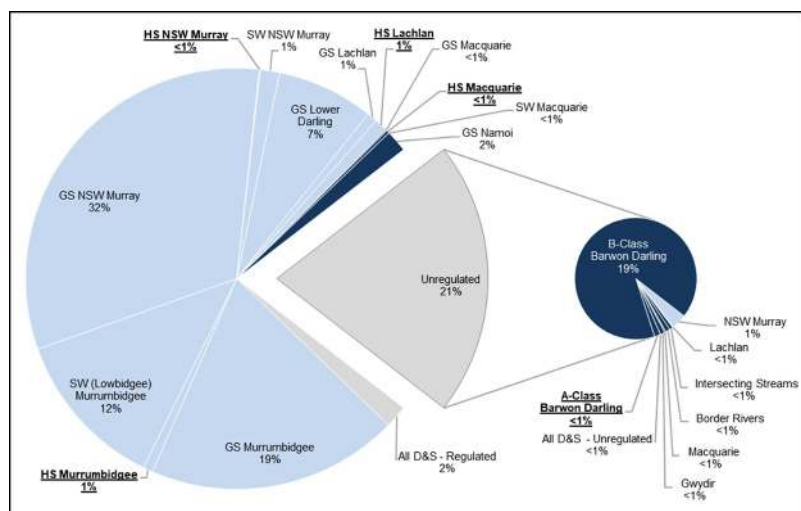


Fig. 4. Standardized volumetric distribution of Aboriginal water holdings in NSW portion of MDB by entitlement type, as of October 2018.

Notes: Light blue denotes southern entitlements, dark blue denotes northern entitlements, and grey denotes a mixture. Bold-type and underlined labels denote (comparatively) more reliable water entitlements.

4.2. Changes in Aboriginal water holdings since 2009: a third dispossession

When we compare the 2018 Aboriginal water holdings to the baseline from 2009, we find an overall decline of at least 17.2 % by standardized volume. The 2009 baseline was composed of 66 entitlements to 14.7 GL_s held by 27 Aboriginal organizations, whereas, by 2018, 25 Aboriginal organizations held 55 water entitlements to 12.1 GL_s. We found no Aboriginal organizations had secured any new volumetric water entitlements over this time (by way of purchase on the open water market or by any other method). In this section, we describe the key sources contributing to this change, noting that both the value of water and activity in the water market increased in the case study area in this period.

The first source of major loss we identify arose from administrative changes to access in the Barwon-Darling catchment prior to the completion of the NSW Government’s staged water reform and license conversion process. As detailed in Section 2.2, we are unable to quantify these changes in a standardized way and they are therefore not reflected in our estimate of loss. Unlike other catchments, between 2006 and 2012, all (former) volumetric Barwon-Darling water entitlements were converted to a share of the calculated ‘long-term average annual extraction’ for the catchment (NSW Office of Water, 2012). The actual water extraction history per entitlement between 1995–96 and 2004–05 determined the exact reduction (Maclean et al., 2012; see also NSW Office of Water, 2012), creating varied and inconsistent reductions across Barwon-Darling water entitlements. We found three of the four Aboriginal water entitlements in this catchment were reduced by a disproportionate amount (just over 75 %) compared with the overall average reduction (62.2 %). The remaining Aboriginal-held entitlement was reduced by 63.0 % in this process, and evidence indicates water allocated to this entitlement had been used between 2000 and 2002 (Jopson, 2002). The approach to reducing entitlements clearly privileged historic water users, and did not consider Aboriginal water requirements or obstacles to water use, such as capital, as matters that deserved special consideration.

The second source of reduction we identify – and the first that contributes to the 17.2 % decline – is the short lifespan or duration of certain Aboriginal-held licenses. Water license register searches reveal a cultural access license (CAL) to the Murrumbidgee River (a form of specific purpose license described in Section 3.2) that was held by an Aboriginal organization in the case study area in 2009. This entitlement constituted 3.3 % of all Aboriginal-held water in 2009 (489 ML_s) but was cancelled in 2011. Unlike most NSW statutory licenses which are treated effectively as perpetual entitlements, CALs expire once their use is complete. What is different in 2018, though, is that all water

available for access via the CAL mechanism in the Murrumbidgee had been transferred to the Riverina Local Land Services, which is a non-Aboriginal government entity. While the entity intends to use this water for Aboriginal benefit (Riverina Local Land Services, 2018), the water is not Aboriginal-held, and so we count this transfer as a ‘loss’.

The third and most significant driver of loss in Aboriginal water holdings is permanent water sales. We categorize these permanent water sales as either strategic and voluntary, or forced. We found strategic and voluntary sales were limited. For example, one organization transferred a portion of their water entitlement (approximately 5%) in exchange for upgrades to their irrigation infrastructure, as part of the Federal Government’s On-Farm Irrigation Efficiency Program. While this exchange was intentional and leveraged the benefit and value of the entitlement, it only presents 0.8 % of total water permanently sold reported here.

Forced water sales occurred via liquidation and insolvency processes. These sales have predominately involved southern Basin entitlements of varied reliability. Possible reasons for liquidation are numerous, but generally are attributable to poor organizational management, ineffectual governance arrangements and/or difficulties in establishing and maintaining financial viability as required by legislation. Pressures that influence the financial viability of Aboriginal landholding organizations are well known (see, for example, Chalk and Brennan, 2015; Norman, 2015; Palmer, 1988). Combined, these permanent water sales constitute a loss of 2.0 GL_s (12.1 %), with an estimated market value of A\$3.4 million (in 2015–16 terms). No evidence indicates that Aboriginal entities purchased these liquidated assets.

At the time of data analysis, at least four other Aboriginal organizations, all in the north of the case study area, appeared vulnerable to or may soon come under administration due to assorted financial, governance or capability issues. This could lead to similar forced water sales of potentially another 778 ML_s (6.4 %), worth at least an estimated A\$565,000 (in 2015–16 terms). Should this eventuate, the Aboriginal population to water ownership ratio reported in Section 4.1 would worsen at the case study scale, and, particularly problematically, in the already disproportionately affected northern region. These results indicate that other remaining Aboriginal water holdings are vulnerable to further losses.¹² Such declines in Aboriginal water ownership would further reduce options for Aboriginal communities to enjoy the purported benefits of water access and water market participation.

¹²The ALRA explicitly prohibits actions like selling Land Council land or winding up these organizations in events of overdue or unpaid land and/or water rates (sections 44 & 89, ALRA), and so are likely protected from these losses.

5. Discussion and conclusion

We have considered the intertwined and complex history of land and water rights regimes in the Australian State of NSW, providing the country's first regional history of water rights dispossession and reacquisition by Aboriginal organizations. The paper confirms that water allocation regimes are strongly conditioned by historical land and water distribution, access and usage patterns (Hodgson, 2004; Jackson, 2017a; OECD, 2015). Land and water tenure arrangements did not recognize or respect Indigenous water rights until relatively recently, and even since this recognition, governments have failed to tackle the enduring effects of colonial dispossession.

Aboriginal people came into the water market era with limited water holdings because their eligibility to hold water licenses was severely curtailed by historical events and structures that determined who owned land (when land and water titles were appurtenant). Land restitution processes that started in NSW in the 1970s, such as statutory land claims and purchasing programs, enabled some reacquisition of water rights, but because they were biased against properties with water or with agricultural potential, reacquisition was significantly constrained. The coincidence of the restitution era with 'closure' of water resources further compounded the effect of these restrictive conditions on Aboriginal water tenure in NSW.

As a result of these factors, and the absence of government commitments to restore water rights to Aboriginal communities after water rights were restructured (Jackson and Langton, 2012; McAvoy, 2006), a markedly inequitable pattern of water holdings in the NSW portion of the MDB has endured. The extent of this inequity is not appreciated in Australian water policy circles. Significantly, Aboriginal people comprise 9.3 % of the case study area's total population but Aboriginal entities in this same region only hold a mere 0.2 % of the surface water available. This figure equated to A\$16.5 million in 2015–16 terms, or 0.1 % of the total value of the MDB water market (ABARES, 2018). Given that Altman and Arthur (2009) found most Aboriginal-held entitlements were within NSW, we expect the volume and proportions of Aboriginal-held water in other parts of the MDB (as well as jurisdictions beyond the Basin) will be even smaller. Additional research is underway to determine whether these patterns are borne out elsewhere in the MDB, and more research is needed to ascertain the situation in Australian regions outside the Basin.

We have also identified differences between the northern and southern portions of the case area and the effect of different forms of entitlements on security of access and value of entitlements. We observe that Aboriginal organizations in the north are disproportionately disadvantaged with regards to water access. The fact that these northern water entitlements are generally not as valuable as in the south illuminates another distributive dimension to the analysis.

Others have described the recent separation of land and water rights in Australia as a process that precipitated a new round of dispossession, for at that time Aboriginal peoples did not have the statutory water rights to convert into tradable water licenses and participate in the water economy (McAvoy, 2006, 2008; O'Neill et al., 2016). With the exception of the tiny fraction we have documented in this paper, almost all water entitlements in the NSW portion of the MDB were granted to non-Aboriginal users as water rights were restructured post-1990s. The results from this research confirm and extend the validity of framing these processes of alienation as dispossession. Further, by quantifying the losses to the small number and size of water holdings that were in the possession of Aboriginal organizations as water markets took hold, we have substantiated the extent of dispossession. Given that Australian governments committed to improving Indigenous water access under national water policy in 2004, the decline in Aboriginal water holdings of at least 17.2 %, plus evidence of ongoing vulnerability, is a significant finding that warrants urgent policy redress.

Most Aboriginal people in the MDB have not been in a position to benefit from the substantial wealth transfers that have occurred

through water trading during the past thirty years. As the water market has grown, new participants have entered – water brokers, environmental water holders, and investors (e.g. superannuation companies) – who can buy water from irrigators or others, including Aboriginal communities. The valorization of water 'assets' in Australia's water market (see Larder et al., 2017) has affected Indigenous rights and interests in two ways. First, water could be more readily leveraged (temporarily or permanently) in exchange for funds to keep poorly resourced Indigenous community organizations afloat. Second, the market provides a potential mechanism to redress historical water exclusion and injustices without impacting on existing legal water users (Macpherson, 2017, 2019; McAvoy, 2006; Productivity Commission, 2017). Recent research found high levels of public support across the MDB jurisdictions for government restitution programs that purchase and reallocate water to Aboriginal peoples for their own uses (Jackson et al. 2019). But, any such government restitution programs will be very costly, politically contentious (Jackson and Langton, 2012) and unlikely to meet the needs of all Aboriginal Nations of the Basin.

Several research directions and policy-oriented recommendations emerge from our analysis. These are focused on the twin goals of redressing historical inequities in access and stemming further losses in water holdings. Our results reiterate the need to analyze rigorously and critically the legal, institutional and social settings in which water market mechanisms operate, including their wider effects, beyond their impacts for irrigators (see O'Donnell and Garrick, 2019). Some have argued that water markets in Australia's MDB have promoted fairness (Grafton et al., 2016). Our study contradicts such a claim, instead finding that the water market in the NSW portion of the MDB both reflects and reproduces structural inequalities stemming from colonial dispossession. A just water policy needs to address the colonial foundation of current allocation mechanisms and the ongoing effects of neoliberal policy on the ability of Aboriginal people to access, manage, care for and benefit from water (and land). For these reasons, we argue that Australian governments also need to review comprehensively the laws that affect Indigenous land and water rights and ensure that they are consistent with international Indigenous rights law (see Macpherson, 2019; Robison et al., 2018).

In any effort to reform water and land policy, it will be imperative that governments take account of the distribution of Aboriginal populations, the spatial extent of Nations' territories and current water holdings, and discuss equity principles and implementation programs extensively with Aboriginal representative bodies. Attention should be paid to the value and reliability of different water entitlements, as well as opportunities from groundwater access (which are not covered in this paper). Additionally, we strongly recommend against imposing restrictive conditions on Aboriginal uses such as precluding commercial use or limiting duration of access. Essentialist definitions that limit Aboriginal water uses to 'cultural' purposes are inequitable and undermine contemporary efforts to engage in economic activity (Jackson and Langton, 2012; Macpherson, 2019; O'Donnell, 2013; Tan and Jackson, 2013).

We particularly stress the need for policymakers to seek the input of Aboriginal representatives in the design and management of any such programs (Macpherson, 2017, 2019; Nelson et al., 2018). Issues such as permanent transferability and alienability of Indigenous water rights are contentious (Robison et al., 2018) but our results point to the urgent need to investigate the pros and cons of mechanisms that restrict permanent trade of Aboriginal water holdings. Further, any policies or programs must be comprehensive and address more than water rights acquisition alone. Access to land, infrastructure, expertise, training and allowances to cover water fees and other costs are also required to enhance the benefits from water access (see Hartwig, 2020; Jackson and Langton, 2012; Productivity Commission, 2017).

Recently, the Australian Government made several commitments to advance Aboriginal water access and these are welcome. In mid-2018, it committed A\$40 million to purchase water entitlements for

Aboriginal people across the Basin (Jackson, 2018b). First Nations and scholars alike remain unsure, however, about the effect of these relatively small funds on patterns of water redistribution (and with what degree of reliability) (Jackson et al., 2019). This is especially so given that this funding commitment represents just 0.2 % of the value of the estimated A\$16.5 billion water market (ABARES, 2018), and given that nearly 20 years ago – when water was far less costly than today – proponents argued that A\$250 million would be needed to sufficiently redistribute water to Aboriginal peoples across NSW alone (see Marshall, 2017; McAvoy, 2006, 2008). The roll out of such a program also has the potential to exacerbate existing economic and social inequities in Aboriginal communities. If water rights need land to be best enjoyed, then providing water only to those who have suitable land on which to use it risks reinforcing existing intra-regional inequities. For this reason, and the fact that the sum is a relatively small one, the impact of this scheme should be closely monitored.

In 2018, the Australian Government took another step in the direction of improving Indigenous access to water by expanding the Indigenous Land and Sea Corporation's long-standing land-focused mandate to assist First Nations acquire and manage lands and waters (see *Aboriginal and Torres Strait Islander Act 2005* (Cth), section 191B). The ILSC Chairperson, Eddie Fry, explained that this shift 'acknowledges that Indigenous people have recognized interests in salt and fresh water country, and view land and water as continuous' (ILC, 2018). While this amendment is welcome, the policy domains of land and water are still treated in isolation in the broader realm of Australian natural resource governance. This comment highlights the environmental and socio-cultural reasons for analyzing the interdependencies of land and water rights and governance, and the range of processes that affect Aboriginal entitlements, in addition to economic ones. Across Australia and within the case study area (see Hunt, 2010; Jackson and Langton, 2012; Jackson and Nias, 2019), Aboriginal organizations are engaged in 'Caring for Country' activities and in doing so are contributing positively to the management of both land and water (Altman and Jackson, 2014). Should Aboriginal landholders continue to lose access to water it might impede their ability to manage both the terrestrial and aquatic domains of their customary estates, and to affirm customary norms and ethics of care and management that do not treat the two separately. This point also highlights the need for policy reforms that improve water access to be implemented in conjunction with policies and programs that empower Aboriginal peoples and strengthen their influence over the governance of water and landscapes more broadly (see, for example, Hemming et al., 2019; Jackson and Nias, 2019; Mooney and Cullen, 2019; Nelson et al., 2018; O'Bryan, 2019).

Finally, our results demonstrate the limits of government approaches that focus on Indigenous consultation and engagement and ignore more substantive redistributive programs or law reform. As we have shown, some Aboriginal organizations obtained land during the restitution era and acquired water entitlements, which many have retained. However, thousands of outstanding land claims and native title claims are still to be heard in NSW (National Native Title Tribunal, 2020; NSWALC, 2018) and it appears likely that water entitlements will not accompany future land transfers under these restitution schemes. In such situations, the land use options of Aboriginal communities will remain severely limited, undermining the original compensatory intent of those schemes. Indeed, continued separate and inadequate treatment of land and water rights may undermine the numerous Indigenous political, cultural and socio-economic goals held by Aboriginal peoples in the State of NSW.

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CRedit authorship contribution statement

Lana D. Hartwig: Conceptualization, Methodology, Formal analysis, Investigation, Project administration, Writing - original draft, Writing - review & editing. **Sue Jackson:** Conceptualization, Supervision, Funding acquisition, Writing - original draft, Writing - review & editing. **Natalie Osborne:** Supervision, Writing - original draft, Writing - review & editing.

Declaration of Competing Interest

None.

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