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Abstract

Coastal Australia is particularly vulnerable to increasingly frequent violent storm events coupled with anticipated rise in sea level. Consequent risks starkly underscore crucial coastal land policies and statutory planning documents. However, current questioning in the State of New South Wales (NSW) of such public instruments has uncovered a critical link between flood risk mapping and land-use planning, property values and, in particular, inundation propensity of various coastal lands. A range of coastal properties will no longer be capable of meaningful utilisation, coalescing in an impending collision between settled Australian property law and property rights. The use of transferable development rights (TDRs) to achieve climate change adaptation and risk amelioration is a planning tool which this article explores as part of the compendium of tools to deal with increasingly impacted coastal lands. The potential of TDRs is canvassed in a case study on a fragile suburban beach, namely Collaroy, in northern Sydney.

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Coastal Climate Change and Transferable Development Rights

John Sheehan, Andrew H Kelly, Ken Rayner and Jasper Brown*

Coastal Australia is particularly vulnerable to increasingly frequent violent storm events coupled with anticipated rise in sea level. Consequent risks starkly underscore crucial coastal land policies and statutory planning documents. However, current questioning in the State of New South Wales (NSW) of such public instruments has uncovered a critical link between flood risk mapping and land-use planning, property values and, in particular, inundation propensity of various coastal lands. A range of coastal properties will no longer be capable of meaningful utilisation, coalescing in an impending collision between settled Australian property law and property rights. The use of transferable development rights (TDRs) to achieve climate change adaptation and risk amelioration is a planning tool which this article explores as part of the compendium of tools to deal with increasingly impacted coastal lands. The potential of TDRs is canvassed in a case study on a fragile suburban beach, namely Collaroy, in northern Sydney.

INTRODUCTION

There is no doubt that rising sea levels continue to threaten human habitation although global apprehension towards loss of land is scarcely recent. Such apprehension is a direct result of climate change, and this awareness “crested” as a systemic phenomenon at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1987.¹ One of its products was *Agenda 21*, a global statement of agreement rather than a convention, which underlined progress in “integrated coastal zone management”.² It contained a special chapter for local government, namely *Local Agenda 21*. Of course, this did not bind Australian local government. While it did excite some councils,³ the political effort was generally lacklustre. Other commentators refer to sources other than UNCED. Bryant points to the Villach Conference in Austria in 1985 (Villach), arranged by the World Meteorological Organization and the United Nations Environment Programme.⁴ According to Bodansky,⁵ Villach was the breakthrough on the high probability of climate change. It led to subsequent symposiums and assemblies, including Kyoto and, more recently, Paris. Franz, on the other hand, suggests that “[t]here [was] little evidence to

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¹ Daniel Bodansky, “The History of the Global Climate Change Regime” in U Luterbacher and D F Spinz (eds), *International Relations and Global Climate Change* (MIT Press, 2001) 23, 23.

² Bruce Coates, David Hanslow and Doug Lord, *NSW Coastal Zone Management Manual* (NSW Department of Environment and Climate Change (Newcastle), 2007) 4 <<http://www.coastalconference.com/2007/papers2007/Bruce%20Coates.doc>>.

³ Raymond Fowke and Deo K Prasad, “Sustainable Development, Cities and Local Government” (1996) 33 *Australian Planner* 61; Valerie Kupke, “Local Agenda 21: Local Councils Managing for the Future” (1996) 14 *Urban Policy and Research* 183.

⁴ Edward Bryant, “Sea-Level and Greenhouse: Tales of the Unexpected” in Kevin McCracken and Russell Blong (eds), *Planning for the Greenhouse* (Macquarie University, 1989) 39.

⁵ Bodansky, n 1.

support the claim that the Villach conference marked a change in scientific consensus”.⁶ Nevertheless, despite arguments over pinpointing when the concept gained traction, its extensive physical impact warrants action.

Both climate-induced displacement of people and environmental destruction are set to occur across various parts of the globe. Whether such events emerge from wholly human-induced and/or a manifestation of a long-term climate shift might remain open to debate. Despite this, sea level rise is squarely viewed as a key land management issue at the core of planning for climate change. Lin et al refer to coastal sites being “highly urbanized” and “widely perceived to be on the ‘front line’ for climate change because increased frequency and magnitude of storm events together with sea level rise” impacting upon “property, infrastructure and economic activity”.⁷ On the other hand, changes to coastal shorelines and actual loss of land are clearly recognised in low-lying vulnerable nations.⁸ A ready example is the French islands where under a worst-case scenario, 12% of the 1,269 islands will disappear, especially within the regions of New Caledonia and French Polynesia.⁹

In Australia, severe coastal damage is occurring in urban and non-urban areas, along a coastline of more than 30,000 km,¹⁰ 50% of which contains stretches of beach.¹¹ Most Australians cling to the coast with 85% residing within 50 km of the shoreline.¹² This is due to a combination of inland aridity, heavily populated capital cities and the “sea change” drift where former city dwellers desire more relaxed beachside lifestyles.¹³

In New South Wales (NSW), Australia’s most populous State, the NSW Government has delineated 15 coastal “hot spots” where “five or more houses and/or a public road are located in a current (or immediate) coastal hazard”.¹⁴ Three “hot spots” are located within the newly established Northern Beaches Council within the Sydney metropolitan area, including the devastated Collaroy beach wherein, as described by Bonyhady, “inappropriate subdivisions had resulted in many houses and some high rises being built not just

⁶ Wendy E Franz, *The Development of an International Agenda for Climate Change: Connecting Science to Policy*, ENRP Discussion Paper E-97-07 (Kennedy School of Government, Harvard University, 1997) 18.

⁷ Brenda B Lin et al, “Assessing Inundation Damage and Timing of Adaptation: Sea Level Rise and the Complexity of Land Use in Coastal Communities” (2013) 19 *Mitigation and Adaptation Strategies for Global Change* 551 doi: 10.1007/s11027-013-9448-0.

⁸ See, for instance, Stacy-Ann Robinson, “Climate Change Adaption in Small Island Developing States” (2017) 22 *Mitigation Adaptation Strategic Global Change* 4669; Thanasis Kizos, Ionnis Spilanis and Abid Mehmood, “Climate Change Vulnerability: Planning Challenges for Small Islands” in Simin Davoudi, Jenny Crawford and Abid Mehmood (eds), *Planning for Planning Change: Strategies for Mitigation and Adaption for Spatial Planners* (Earthscan, 2009) 94; Ilan Kelman, “No Change for Climate Change: Vulnerability and Small Island Developing States” (2014) 180 *The Geographical Journal* 120; Caroline Haywood, “The European Union’s Emissions Trading Scheme: International Emissions Trading Lessons for the Copenhagen Protocol and Implications for Australia?” (2009) 26 *EPLJ* 310.

⁹ Celine Bellard, Camille Leclerc and Frank Courchamp, “Potential Impact of Sea Level Rise on French Islands Worldwide” (2013) *Nature Conservation* doi: 10.3897/natureconservation.@@.5533; Robert Kay, Ailbhe Travers and Luke Dalton, “A Tale of Two Atoll Nations: A Comparison of Risk, Resilience, and Adaptive Response of Kiribati and the Maldives” in Bruce Glavolic, Mick Kelly and Robert Kay (eds), *Climate Change and the Coast: Building Resilient Communities* (CRC Press, 2014) 313.

¹⁰ Kevin Roche, Ian Goodwin and John McAneney, “Management of the Coastal Zone in Byron Bay: The Neglect of Medium-Term Considerations” (2013) 20 *Agenda: A Journal of Policy Analysis and Reform* 21, 21.

¹¹ Robert Kay, Ailbhe Travers and Luke Dalton, “The Evolution of Coastal Vulnerability Assessments to Support Adaptive Decision-making in Australia: A Review” in Bruce Glavolic, Mick Kelly and Robert Kay (eds), *Climate Change and the Coast: Building Resilient Communities* (CRC Press, 2014) 250. See also Andrew D Short and Colin D Woodroffe, *The Coast of Australia* (CUP, 2008).

¹² Department of Climate Change and Energy Efficiency (Cth), *Adapting to Climate Change in Australia – An Australian Government Position Paper* (2010) <<http://coastaladaptationresources.org/PDF-files/1236-gov-adapt-climate-change-position-paper.pdf>>. See also Kay et al, n 11. For an earlier dialogue, see Peter Cullen, “Coastal Zone Management in Australia” (1982) 10 *Coastal Zone Management Journal* 183.

¹³ See Raymond James Green, *Coastal Towns in Transition: Local Perceptions of Local Change* (CSIRO Press, 2010); Ian Burnley and Peter Murphy, *Sea Change: Movement from Metropolitan to Arcadian Australia* (UNSW Press, 2004).

¹⁴ Office of Environment and Heritage (NSW), *Coastal Erosion “Hot Spots”*, 26 February 2011 <<http://www.environment.nsw.gov.au/coasts/coasthotspots.htm>>.

one the dunes but on the beach”.¹⁵ The Centre for Coastal Management at Griffith University has examined severe storms events along the east coast since European contact in 1770, concluding that there will be not only damage or destruction to beachfront properties but also “severe storms” causing dramatic “changes to the coast”.¹⁶ While severe storms are cyclical, “the impact of climate change on storm events and storm surge is highly uncertain and subject to considerable regional variation”.¹⁷

The fifth assessment report by the Intergovernmental Panel on Climate Change (IPCC) in 2013 estimated the likely range of sea level rise as between 26 cm and 82 cm, relying on varying greenhouse gas emissions scenarios.¹⁸ However, the document did not rule out the possibility of further sea level rise. Its figures are considerably higher than the 2007 IPCC report, where the range was between 21cm and 59 cm.¹⁹ Steffen notes that faster climatic change has implications for sea level rise now expected at the upper end of projections by the IPCC at around 0.8 m by 2100.²⁰ He points out, however, that sea level rises beyond the range of 0.5 m–1.0 m, perhaps at even 1.5 m, “cannot be ruled out”.²¹ Even a modest rise of 0.5 m, which lies around the centre of IPCC projections, may result in extensive coastal impacts. Regarding storms and extreme events, Steffen pointed out that it is difficult to ascertain whether these occurrences “have been increasing over the past several decades” due to quality and limited time sets.²² All this means that effective and adaptive mechanisms warrant considerable attention.

This article begins by exploring the issue of sea level rise especially in NSW, before moving on to an overview of the relevant aspects of the NSW planning system, which arguably have a profound effect on property values. It then leads on to shadowy issues dealing with the impairment or even loss of private property rights, progressing to the nub of the narrative, namely Transferable Development Rights (TDRs). Finally, the case study of Collaroy beach is canvassed. The suburb of Collaroy was part of the former Warringah Council which, together with Manly and Pittwater Councils, were incorporated into the monolithic Northern Beaches Council on 16 May 2016.²³

GOVERNMENT RESPONSE TO SEA LEVEL RISE PREDICTIONS

While the six Australian States have attempted to provide information and guidance to local government and development aspirants, unfortunately legal and policy planning differs between the jurisdictions.²⁴ This situation has led to variations in sea level benchmarks, causing major concern to landholders

¹⁵ Tim Bonyhady, “Swimming in the Streets: The Beginnings of Planning for Sea Level Rise” in Tim Bonyhady, Andrew Macintosh and Jan McDonald (eds), *Adaption to Climate Change: Law and Policy* (Federation Press, 2010) 80, 85.

¹⁶ Jeff Callaghan and Peter Helman, *Severe Storms on the East Coast of Australia 1770 to 2006* (Griffith Centre for Coastal Management, Griffith University, Gold Coast, 2008) <<http://www.goldcoast.qld.gov.au/documents/bf/storms-east-coast-1770-2008.pdf>>.

¹⁷ Andrew Macintosh, Anita Foerster and Jan McDonald, *Limp, Leap or Learn? Developing Legal Frameworks for Climate Change Adaptation Planning in Australia* (National Climate Change Adaption Research Facility, Gold Coast, 2013).

¹⁸ Poh Poh Wong et al, “Coastal Systems and Low-lying Areas” in Christopher B Field, Vicente R Barros, David Jon Dokken, Katharine J Mach, Michael D Mastrandrea, T Eren Bilir, Monalisa Chatterjee, Kristie Ebi, Yuka Otsuki Estrada, Robert C Genova, Betelhem Girma, Eric S Kissel, Andrew N Levy, Sandy MacCracken, Patricia R Mastrandrea and Leslie L White (eds), *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (CUP, Cambridge, United Kingdom and New York, NY, 2014) 366.

¹⁹ John A Church et al, “Sea Level Change” in Thomas Stocker, Dahe Qin, Gian-Kasper Plattner, Melinda Tignor, Simon Allen, Judith Boschung, Alexander Nauels, Yu Xia, Vincent Bex and Pauline Midgley (eds), *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (CUP, Cambridge, United Kingdom and New York, NY, USA, 2013) 1185.

²⁰ Will Steffen, *Climate Change 2009: Faster Change & More Serious Risks* (Department of Climate Change Canberra, 2009) 1.

²¹ Steffen, n 20, 1.

²² Steffen, n 20, 25.

²³ Northern Beaches Council, *Council History* (Northern Beaches Council, undated).

²⁴ Anita Foerster, Andrew Macintosh and Jan McDonald, “Transferable Lessons for Climate Change Adaptation Planning? Managing Bushfire and Coastal Hazards in Australia” (2013) 30 EPLJ 469, 476; Nick Harvey, Beverley Clarke and Melissa Nursey-Bray, “Australian Coastal Management and Climate Change” (2012) 50 *Geographical Research* 356; Justine Bell, *Climate Change and Coast Development Law in Australia* (Federation Press, 2014).

and property developers. In particular, apprehension arises over the extent of private property rights, site utilisation and property insurance. Craddock and Teale suggest that a lack of awareness of the probability of loss can lead to underinsurance.²⁵ This means that flood events might be excluded from insurance policies where the policyholder (as owner of land with a relatively low sea level rise benchmark) has not sought flood insurance. Nevertheless, the policyholder could have been unaware of any genuine risk.

Many if not all taxpayers living outside areas of current and predicted coastal damage might be unwilling to financially support landholders whose properties are becoming uninhabitable due to coastal impact. In relation to a potential revetment wall built to ameliorate erosion in Collaroy, local citizens have expressed concern about the cost being passed on to other landowners away from the beachfront. For instance, Graeme Garlick of Beacon Hill within the Northern Beaches Council area has indicated in the local media that the Collaroy beachfront landowners protected by the proposed wall would be the undeserving beneficiaries.²⁶

In NSW, the (then) Department of Environment and Climate Change (Department of ECC) published in February 2009 the *Draft Sea Level Rise Policy Statement (2009 Statement)*, which set benchmarks for sea levels in 2050 at 40 cm above 1990 mean sea levels and in 2100 at 90 cm above 1990 mean sea levels.²⁷ The *2009 Statement* was issued in part to guide local government in assessing applications for development. It also states that the Department of ECC planned to provide “guidelines on how sea level rise should be considered in land use planning and development approval decisions by councils” while supplying “guidance to landowners, infrastructure providers and developers”.²⁸ However, the *2009 Statement* states, “there is no regulatory or statutory requirement for development to comply with this benchmark”.²⁹ Subsequently, in 2013, O’Donnell and Gates noted that the lack of statutory force made this policy difficult to implement.³⁰ Specifically, there was insufficient State Government support for councils who sought to implement adaptation measures due to “potential legal actions or liability from developers and residents concerned about planning controls and insurance risks”.³¹ Coastal local government bears responsibility for assessing and determining most development applications, and appears to regard the *2009 Statement* as inadequate. For instance, Mayor David James of former Pittwater Council claimed that:

[i]f there’s no support from the government, it leaves us damned if we do and damned if we don’t ... if we approve something within the 40cm limit, we could be subject to damages if it subsequently floods or is eroded, but if we refuse it we can get carted off to the Land and Environment Court.³²

In a sober assessment, the former Pittwater Council’s *Pittwater Estuary Mapping of Sea Level Rise Impacts* identified 1,907 properties at risk of estuarine floods by the year 2100.³³ Subsequently, the *2009*

²⁵ Lucy Craddock and John Teale, “A Sunburnt Country – Storms, Surges and Sea Levels: of Insurance and Flooding Rains” (2014) 34 *Geography Research Forum* 124.

²⁶ Graeme Garlick, “Not a Question of Wall but Who Pays for It”, *The Manly Daily* (Sydney) 13 May 2017, 24.

²⁷ Department of Environment and Climate Change (NSW), *Draft Sea Level Rise Policy Statement (2009)* 3 <[https://sscebp.ssc.nsw.gov.au/ebp/webpapr.nsf/bd67cc696063c12cca25709d00063c2b/4bbb6acb925a22f3ca2575630000da4c/\\$FILE/Draft%20Sea%20level%20Rise%20Policy%20Statement.pdf](https://sscebp.ssc.nsw.gov.au/ebp/webpapr.nsf/bd67cc696063c12cca25709d00063c2b/4bbb6acb925a22f3ca2575630000da4c/$FILE/Draft%20Sea%20level%20Rise%20Policy%20Statement.pdf)>.

²⁸ Department of Environment and Climate Change (NSW), n 27, 4.

²⁹ Department of Environment and Climate Change (NSW), n 27, 3.

³⁰ Tayanah O’Donnell and Louise Gates, “Getting the Balance Right: A Renewed Need for the Public Interest Test in Addressing Coastal Climate Change and Sea Level Rise” (2013) 30 *EPLJ* 220.

³¹ O’Donnell and Gates, n 30, 224.

³² David James, “Pittwater Council Community Noticeboard”, *The Manly Daily* (Sydney) 18 July 2009, 10.

³³ Cardno (NSW/ACT) Pty Ltd, *Pittwater Estuary Mapping of Sea Level Rise Impacts*, prepared for Pittwater Council (Cardno (NSW/ACT) Pty Ltd, 2015) 14 <<http://portal.pittwater.nsw.gov.au/common/Output/DataworksAccess.aspx?id=SKaPXKEE8qY%253d&ext=pdf>>.

Statement was repealed on 8 September 2012 due to, among various factors, “uncertainty in rate of change and location” of sea level rise.³⁴

Notwithstanding the above, local government is now attempting to assess the effects of sea level rise and storm events on land potentially threatened. Vulnerability mapping is a critical tool in the development control process.³⁵ The rigidity of statutory local planning is the fundamental problem here, as will be examined. Under the *Environmental Planning and Assessment Act 1979* (NSW), the two species of statutory documents, namely environmental planning instruments (EPIs), comprise (1) State Environmental Planning Policies (SEPPs) and Local Environmental Plans (LEPs).³⁶ LEPs are generally prepared by local councils but are made by the Minister. Unlike subsidiary legislation such as the *Environmental Planning and Assessment Regulation 2000* (NSW) (*EPAR 2000*),³⁷ EPIs need not be placed before the NSW Parliament. Further, councils produce Development Control Plans (DCPs), which are “not legally binding on decision-makers who are considering applications for development consent”.³⁸ Adding to the complex jumble of planning documents, individual councils may prepare their own policies and strategies.

A ready example is the former Pittwater Council’s *Strategic Planning for Sea Level Rise and Climate Change Influenced Inundation*, adopted in February 2010.³⁹ Parramatta City Council, which lies at the westernmost tidal limit of Sydney Harbour’s major tributary, namely the Parramatta River, released in September 2010 a manuscript incorporating a strategic sea level rise policy.⁴⁰ However, the absence of mandatory compliance with the *2009 Statement* on sea level rise has proved to be problematic. Attempts by councils to follow the *2009 Statement* have attracted “vociferous resistance”, which led councils to be seen as “acting unilaterally rather than in concert with the State”.⁴¹

Adding to the uncertainty, in September 2010 the NSW Government released the draft *Environmental Planning and Assessment Regulation 2010* (NSW) to replace the *EPAR 2000*.⁴² While it never became law, the *2010 Draft Regulation* did propose additional matters to be taken into account when determining development applications, including projected sea level rises of 0.4 m in 2050 and 0.9 m in 2100.⁴³ The use of these projections however, was negated by the bizarre corequirement that in determining

³⁴ Heather Stevens et al, “Sea No Evil, Hear No Evil – Community Engagement on Adaptation to Sea Level Change” (Paper presented at the 21st NSW Coastal Conference, Kiama, 2012) 4.

³⁵ Chris Harty, “How Can Planning Address the Effects of Sea Level Rise?” (2008) 45 *Australian Planner* 24.

³⁶ For further information on the nature and background of these instruments, see Amanda Thorpe, “Land Use Planning” in Peter Williams (ed), *The Environmental Law Handbook: Planning and Land Use in NSW* (Thomson Reuters, 2016) 89; John Whitehouse, *Development and Planning Law in New South Wales* (CCH Australia Ltd, 2012); Rosemary Lyster et al, *Environmental and Planning Law in New South Wales* (Federation Press, 2016); Nicole Gurran, *Australian Urban Land Use Planning: Principles, Systems and Practice* (Sydney University Press, 2011). Upon the commencement of “state environmental planning policies” and “local environmental plans”, there were also “regional environmental plans”, which have since been enveloped into SEPPs. However, local councils can prepare their own non-statutory voluntary regional and local strategic plans. Further, the *Environmental Planning and Assessment Act 1979* (NSW) was recently altered to enable the making of strategic “regional plans” and “district plans”: see Pt 3B “Strategic Planning” and, in particular, ss 75AE–75AF.

³⁷ See *Environmental Planning and Assessment Act 1979* (NSW) ss 157, 158E.

³⁸ See Thorpe, n 36, 126.

³⁹ Pittwater Council, *Strategic Planning for Sea Level Rise and Climate Change Influenced Inundation* (Pittwater Council, 2010).

⁴⁰ Parsons Brinckerhoff Australia Pty Ltd, *Climate Extremes Risk Assessment and Adaptation Plan* (Parsons Brinckerhoff Australia Pty Ltd, 2010) <http://old.parracity.nsw.gov.au/_data/assets/pdf_file/0015/106062/D01922216_PCC_ClimateExtremesAdaptationPlanApr2011.pdf>.

⁴¹ O’Donnell and Gates, n 30, 225.

⁴² It is worth noting that the Environment Defenders Office was strongly in favour of the proposed additional requirement for councils to take into consideration sea level rise benchmarks when assessing development applications under *Environmental Planning and Assessment Act* (1979) s 79C. See Environment Defenders Office (NSW), *Submission on the Draft Environmental Planning and Assessment Regulation 2010* (5 November 2010) <http://d3n8a8pro7vhmxc.cloudfront.net/edonsw/pages/207/attachments/original/1380536920/101105epa_reg.pdf?1380536920>.

⁴³ See *Draft Environmental Planning and Assessment Regulation 2010*, cl 123(2).

development applications, the NSW Coastal Policy 1997⁴⁴ must be taken into consideration.⁴⁵ However, the 1997 Policy specifically does not apply to the heavily urbanised “areas of the Sydney, Newcastle, Illawarra and Central Coast regions”,⁴⁶ which includes the former Warringah Council Area. Notably, this part of NSW contains four official coastal “hot spots”.⁴⁷ While the NSW Coastal Policy 1997 still prevails, it represents a “whole-of-government” approach and intended to bring coastal management into the planning system.⁴⁸ Unfortunately, the draft provision was somewhat weak, as local councils were merely required to “take account” of the 1997 Policy.⁴⁹

Various parts of the coastline demand distinct tactics. Beach landscapes and coastal contours differ. This can lead to dissimilar methods between councils. As a result, the Australian Council of Local Government identified the need to increase moves towards national consistency in applying sea level rise benchmarks,⁵⁰ given the variation between Australian jurisdictions. Coates et al stress the need for “integrated coastal zone management”, referring back to Agenda 21, which was mentioned earlier.⁵¹

Given the disparate and often flawed Australian responses, it is of concern that this situation reveals a much deeper uncertainty now apparent in survey and property law, which is discussed in the subsequent sections. The sheer intricacy of coastal law in NSW will be outlined below.

MORE LEGAL COMPLEXITY AND CONFUSION

By the time the *Environmental Planning and Assessment Act 1979* (NSW) (*EPA Act*) commenced, little attention had been paid to coastal erosion. In Bonyhady’s discussion of property damage during the 1970s at Wamberal Beach north of Sydney in *Egger v Gosford Shire Council* (*Egger*),⁵² it was noted that coastal engineers scarcely existed at that time. Since then, engineers have taken a major role in constructing and managing infrastructural works along the vulnerable NSW coastline. Local planners were then fixed to regulating the use of land via zoning and development standards, rather than adaptive management.⁵³ Their early primitive mechanisms derived from pre-1947 British planning law,⁵⁴ which were adopted by ancient planning instruments under Part XIA of the *Local Government Act 1919* (NSW), subsequently translated into EPIs under the *EPA Act*. Land-use regulation remained the crux of Australian planning statutes. Platt’s alternative mechanisms, namely incentives and land acquisition,⁵⁵ are overridden by command-and-control.

⁴⁴ NSW Government, *NSW Coastal Policy 1997: A Sustainable Future for the New South Wales Coast* (Department of Urban Affairs and Planning, 1997), 23.

⁴⁵ See *Draft Environmental Planning and Assessment Regulation 2010*, cl 123(1)(a).

⁴⁶ NSW Government, n 44, 23.

⁴⁷ Office of Environment and Heritage (NSW), n 14.

⁴⁸ Nick Harvey et al, “Evolution of Sustainable Coastal Management and Coastal Adaption to Climate Change” in Richard Kenchington, Laura Stocker and David Wood (eds), *Sustainable Coastal Management and Climate Adaptation* (CSIRO Publishing, 2012) 79.

⁴⁹ NSW Government, n 44, 25.

⁵⁰ Australian Local Government Association, *Local Council Risk of Liability in the Face of Climate Change – Resolving Uncertainties* (Baker and Mackenzie, 2011) 15–16 <<http://alga.asn.au/site/misc/alga/downloads/environment/ALGA%20Consolidated%20Report-v7B-1392955-SYDDMS%20-%20Final.pdf>>.

⁵¹ Coates et al, n 2.

⁵² *Egger v Gosford Shire Council* (1989) 67 LGRA 304; Bonyhady, n 15, 81–82. See also Andrew H Kelly and Jasper Brown, “Climate Change, Coastal Erosion and Local Government in New South Wales: Old and New Law and Old Bar” in Fennie van der Straalen, Thomas Hartmann and John Sheehan (eds), *Property Rights and Climate Change: Land-Use under Changing Environmental Conditions* (Routledge Complex Real Property Rights Series, 2018).

⁵³ For the meaning of “development standard”, see *Environmental Planning and Assessment Act 1979* (NSW) s 4. Development standards relate to the extent to which a development may be carried out that is already permissible under the relevant zoning; examples include siting, bulk and scale of a building (see s 4(c)).

⁵⁴ Whitehouse, n 36, 5–7; Murray R Wilcox, *The Law of Land Development in New South Wales* (Law Book Co, 1967) Ch 8.

⁵⁵ Rutherford H Platt, *Land Use Control: Geography, Law and Public Policy* (Prentice Hall, 1991); for an extended catalogue, see Whitehouse, n 36, 5.

While a number of SEPPs relate to coastal development,⁵⁶ LEPs are more prosaic instruments. Due to some imaginative thinking, more flexibility in NSW plan making occurred in the 1990s and even earlier. One instance of such flexibility is the utilisation of TDRs to preserve historic buildings in Sydney CBD, as discussed further below. Another example is former Warringah LEP 2000, which moved away from conventionally based zoning to place-based provisions, with proposals required to meet objectives set down in “locality statements”.⁵⁷ These provisions were subsumed by Warringah LEP 2011 pursuant to the Standard Instrument (LEP) Order introduced on 30 March 2006 (known generally as the LEP Template),⁵⁸ designed to apply across local government areas. This has served to paralyse planning creativity,⁵⁹ supporting the general observation that local instruments are becoming increasingly inflexible.⁶⁰

Clause 5.5 of the LEP Template deals with development within the “coastal zone”,⁶¹ which is different to the general restrictive zones listed within LEPs such as “R2 Low Density Residential” and “R3 Medium Density Residential”.⁶² Its subprovisions are generally weak. For example, it lists matters that must merely be considered, such as “the type of the proposed development and any associated land uses or activities”.⁶³ This might include infrastructural works to mitigate coastal erosion. There must also be consideration of “cumulative impacts of the development”.⁶⁴ The weakness here is that such matters need only be taken into account. Those factors where the decision-maker must be “satisfied” that are far more restrictive.⁶⁵ Warringah LEP 2011 slavishly follows the LEP Template, thereby echoing the emphasis on regulation rather than on incentivism within Platt’s three elements noted above.⁶⁶ By way of comment, cl 5.5 of the LEP Template is stipulated as a “compulsory” rather than “optional” provision.

Reference should also be made of the *Coastal Protection Act 1979* (NSW), which contains the preparation Coastal Zone Manage Plans (CZMPs).⁶⁷ These are not statutory EPIs and, therefore, do not contain the unbending nature of LEPs. This Act will be replaced by the *Coastal Management Act 2016* (NSW), which was assented to on 7 June 2006 but has not yet been activated. The CZMPs will be overtaken by Coastal Management Programs,⁶⁸ which also will not carry the force of law. It appears that the NSW Government, however, does not expect councils to “start over [again]”.⁶⁹ Former

⁵⁶ Kelly and Brown, n 52; Andrew H Kelly, “An Overview of the Coastal Management in the Planning System of New South Wales (NSW), Australia, at the Local Government Level: Is an Environmental Statutory Shift in Planning Law Overdue?” (2014) 34 *Geography Research Forum* 9.

⁵⁷ Stevan Untaru, “Regulatory Frameworks for Place-based Zoning” (2002) 20 *Urban Policy and Research* 169; John Mant, “Putting Place Outcomes at the Centre of Planning Law and Administration” (2000) 37 *Australian Planner* 59.

⁵⁸ See *Environmental Planning and Assessment 1979* (NSW) s 33A.

⁵⁹ Andrew H Kelly and Christopher Smith, “The Capriciousness of Australian Planning Law: Zoning Objectives in NSW as a Case Study” (2008) 26 *Urban Policy and Research* 83.

⁶⁰ Foerster et al, n 24; Robert Ghanem and Kirsty Ruddock, “Are New South Wales’ Planning Laws Climate-Change Ready?” (2011) 28 *EPLJ* 17.

⁶¹ At the time of writing, under the *Coastal Protection Act 1979* (NSW), the coastal zone relates to land “generally [within] one km landward of the western boundary of the coastal waters of the State”, which includes bays, estuaries and inward rivers: see ss 4, 4A(3)(a)–(c). These may be mapped. See also Rosemary Bullmore, “Coastal and Riverside Land” in Peter Williams (ed), *The Environmental Law Handbook: Planning and Land Use in NSW* (Thomson Reuters, 2016) 669, 672–673. This statute, as noted in the text, will be superseded by the *Coastal Management Act 2016* (NSW).

⁶² Standard Instrument (Local Environmental Plans) Order, cl 2.1.

⁶³ Standard Instrument (Local Environmental Plans) Order, cl 5.5(2)(a)(i).

⁶⁴ Standard Instrument (Local Environmental Plans) Order, cl 5.5(2)(f).

⁶⁵ Standard Instrument (Local Environmental Plans) Order, cl 5.5(3).

⁶⁶ See Platt, n 55. The one incentive provision within the Standard Instrument (Local Environmental Plans) Order relates to conservation of heritage: see cl 5.10(10). It does not relate to transferable development rights.

⁶⁷ See *Coastal Protection Act 1979* (NSW) Pt 4A.

⁶⁸ See *Coastal Management Act 2016* (NSW) ss 12–20.

⁶⁹ NSW Office of Environment and Management, *Coastal Management Reforms: Questions and Answers* (Office of Environment and Management, 2016) <<http://www.environment.nsw.gov.au/coasts/coastreforms-faq.htm>>.

Warringah Council produced a CZMP for Collaroy-Narrabeen and Fishermans Beach in 2014.⁷⁰ The CZMP outlines the coastline hazards that are a threat to Collaroy, and incorporates “innovative” risk management strategies such as beach nourishment.⁷¹

COASTAL MIASMA

The differing responses of State and local governments on sea level rise and storm events remain clearly inadequate. One factor is the existing and extensive development along the Australian coastal zone indicates very high land value. If future “green field” development or redevelopment of existing coastal properties is constrained or even denied, claims for compensation and subsequent litigation are an obvious concern for government. As a result, the NSW *2009 Statement* attempted to offset the prospect of any such claims through the disclaimer that:

Coastal hazards and flooding are natural processes and the Government considers that the risks to properties from these processes appropriately rest with the property owners, whether they be public or private. This will continue where these risks are increased by sea level rise. Under both statute and common law, the Government does not have nor does it accept specific future obligations to reduce the impacts of coastal hazards and flooding caused by sea level rise on private property.⁷²

This position clearly places liability wholly with the private property holder. This is contrary to Hiatt’s research indicating that long settled American property law, particularly the common law doctrine of erosion and accretion, needs to be revised to accommodate the impending collision between climate change and tidal private property.⁷³ Hiatt points out the anticipated sea level rise will present hitherto unknown challenges to property law, especially where “vast amounts of private lands that are submerged by the ocean ... have become tidal lands and waters subject to a public trust”.⁷⁴ He also notes that there is an urgent need to address outdated concepts of property law given that a one-metre increase in sea level would result in approximately [64,750 sq km] of the lower 48 States being submerged in the next century. Paradoxically, Hiatt also observes that population, property investment and values in coastal areas have continued to increase, regardless of the sea level threat.⁷⁵ During his discourse, Hiatt adds that the Fifth Amendment of the American *Constitution* requires “just compensation” to be paid when private property rights are extinguished while never contemplating that climate change causes permanent inundation of private property.⁷⁶ Notwithstanding this, some guidance is offered by Huffman who detects that historically, in disputes over ownership of navigable submerged land, “the burden was on the private claimant to prove title, consistent with the English *prima facie* rule”.⁷⁷ He further points out the American Revolution converted the presumptive Crown title to a “rule of sovereign title and was applied to navigable waters and submerged land”.⁷⁸ In a prophetic comment, Huffman notes that the law is not locked in time, indicating that:

⁷⁰ Warringah Council, *Coastal Zone Management Plan for Collaroy-Narrabeen Beach-and Fishermans Beach* (2014). See also Northern Beaches Council, *Coastal Zone Management Plan: Collaroy-Narrabeen Beach-and Fishermans Beach* <<http://yoursay.northernbeaches.nsw.gov.au/czmp-narrabeen-beach>>. The electronic document states that “[t]he final CZMP has been provided to the NSW Minister for certification”.

⁷¹ Warringah Council, n 70, 3.

⁷² Department of Environment and Climate Change (NSW) (2009), n 27, 4.

⁷³ Michael Hiatt, “Come Hell or High Water: Re-examining the Takings Clause in a Climate Changed Future” (2008) 18 *Duke Environmental Law & Policy Forum* 371, 371.

⁷⁴ Hiatt, n 73, 371. The phrase “public trust” is generally comparable to the Australian notion of crown land below mean high-water mark.

⁷⁵ Hiatt, n 73, 376.

⁷⁶ Hiatt, n 73, 386.

⁷⁷ James Huffman, “Speaking of Inconvenient Truths – A History of the Public Trust Doctrine” (2008) 18 *Duke Environmental Law & Policy Forum* 1, 78.

⁷⁸ Huffman, n 77, 94.

[i]t must adapt to changing circumstances and the evolving values of our society. One of the great strengths of the common law has been its adaptability over many centuries in the hands of judges with the wisdom to preserve the rule of law by adapting the law, not the interests in the case in hand, but to the realities of a changing society.

The research by Hiatt is particularly useful as the United States is the largest common law country behind India with an English legal heritage. British law was also the initial law of the Australian colonies, transmitted as “invisible baggage”,⁷⁹ while the received common law has altered over time, the American issues raised by Hiatt are also pertinent to Australia. If Australian private property rights are to be inevitably and irreversibly damaged by sea level rise, and have no longer any practical private utility, the question emerges as to what practicality remains for the former tidal boundary or, under common law, the mean high-water mark.⁸⁰

Sea level rises from global warming are anticipated by Smith and Shearman to be “a major legal” issue within many countries.⁸¹ Australia could be fertile ground for climate change litigation, given the 2014 national projections reveal \$226 billion worth of infrastructure (including almost 250,000 dwellings) are at risk from sea level rise. In NSW, the estimates reveal that the replacement value of light industrial, commercial and residential property would be approximately \$30 billion, with nearly 68,000 dwellings at risk.⁸²

The Australian *Constitution* at s 51(xxxi) sets out guarantees of compensation when private property rights are commuted, markedly similar to the Fifth Amendment of the American *Constitution*. However, the 1890s colonial architects never envisaged compensation for climate effects as they wrote the draft *Constitution* on the Hawkesbury River at the north-eastern rim of the Sydney Basin.⁸³ Given the above, the following section explores the possible use of radical interventionist property rights-related tools to ameliorate the impact of climate-related flood impacts along the NSW coastline.

TDRs To AMELIORATE CLIMATE CHANGE IMPACTS?

Hiatt raised the tantalising prospect of whether increasing inundation of tidal private property in the United States could be construed as a regulatory taking and/or acquisition invoking the payment of compensation. Similarly, the notion of climate-related compensation could arise in some future Australian litigation. The issue to be addressed is whether a passive acquisition of private property rights has occurred over time as in the common law principle of erosion. Additionally, whether State and/or local government have acted in a manner which has, at least, partially caused climate change and consequent coastal erosion.

Arguably, owners of private property along the Australian coast must have already anticipated that some or all of their land may become submerged over time through sea level rise and increased storm events (excluding landholders who purchased coastal property before climate changes became apparent). If so, the potential inundation of these lands could be regarded as merely a reasonable expectation and risk of ownership and accordingly, compensation may be unavailable. Alternatively, the increasing influence of climate change impacts on settled property law will result in innovative jurisprudence to

⁷⁹ Michael Coper, *Encounters with the Australian Constitution* (CCH Australia Ltd, 1987) 50.

⁸⁰ Peter Butt, *Land Law* (Lawbook Co, 2010) 28. Butt refers to the mean high-water mark as “the line of the medium high tide behind the highest tide each lunar month (the springs) and the lowest tide each lunar month (the neaps), averaged out over the year – that is, the limit reached by the highest ordinary tides of the sea”. See also Frank K Ticehurst, *Hallmann’s Legal Aspects of Boundary Surveying as Apply in New South Wales* (The Institution of Surveyors Australia Inc, New South Wales Division, 2009) [13.39]–[13.42].

⁸¹ Joseph Smith and David Shearman, *Climate Change Litigation: Analysing the Law, Scientific Evidence and Impacts on the Environment, Health and Property* (Presidian Legal Publications, 2006) 6.

⁸² Will Steffen, John Hunter and Lesley Hughes, *Counting the Costs: Climate Change and Coastal Flooding* (Climate Council of Australia Ltd, 2014) 22, 24 <<http://www.climatecouncil.org.au/uploads/56812f1261b168e02032126342619dad.pdf>>.

⁸³ Coper, n 79, 66.

ameliorate unanticipated impacts on private property rights and their values. In a sombre analysis of the similar New Zealand situation, Strack observed that:

there is a strong expectation that land and property rights should be permanent and protected from loss. The judicial, legislative and policy suggestions to the contrary will require careful negotiation. But just as the physical defences against the power of the sea are failing, inevitably, so too will people and property give way to the sea.⁸⁴

Australian private coastal properties are increasingly being listed as vulnerable by governments, such as those covered by the NSW Government's listed "hot spots",⁸⁵ "Coastal Zone Management Plans"⁸⁶ and various local strategies. This leads to increasing awareness of the adverse impact of such vulnerability upon property values. An innovative and acceptable approach to compensation mechanisms for impacted coastal property is needed, which maintains private property values while not necessarily compromising storm protection.

One such innovative approach is TDRs, which break "the link between a specific plot of land and its development potential by allowing the transfer of that potential [to] somewhere else".⁸⁷ Chiodelli and Moroni go further by explaining that TDRs do "not intensify development, but simply redistribute it".⁸⁸ Machemer and Kaplowitz helpfully describe the TDR trigger as "one the development rights are severed from a parcel and transferred to another property, a restriction is placed on the future use of the transferring property".⁸⁹ Giordano traces the TDR scheme to a 1916 New York zoning ordinance that permitted "adjacent lots to combine their air rights to erect a tower exceeding height regulations".⁹⁰ Interestingly, the similar but updated concept led to judicial consideration regarding Grand Central Terminal, wherein a proposal for skyscraper above the landmark station was refused on the basis of the meaning of "adjacent".⁹¹ Various US schemes for the transfer of floor space canvassed by Chan and Hou aim "to meet both development and preservation goals".⁹² TDRs have also been developed for other purposes such as landscape protection in The Netherlands.⁹³ In the United States, TDR schemes have expanded to areas such as preserving forests, agricultural land and sites of scenic value,⁹⁴ while

⁸⁴ Mick Strack, "Property Loss due to Coastal Erosion: Judicial, Legislative and Policy Interventions" (Paper presented at the Construction, Building and Real Estate Research Conference of the Royal Institution of Chartered Surveyors (COBRA), Université Paris-Dauphine, 2–3 September 2010) 1103.

⁸⁵ Office of Environment and Heritage (NSW), n 14.

⁸⁶ *Coastal Protection Act 1979* (NSW) Pt 4A.

⁸⁷ Francesco Chiodelli and Stefano Moroni, "Zoning–Integrative and Zoning–Alternative Transferable Development Rights: Compensation, Equity, Efficiency" (2016) 52 *Land Use Policy* 422. For a more recent analysis, see Rick Pruetz, "Transferable Development Credits Puts Growth in Its Place" in Rebecca Leshinsky and Crystal Legacy (eds), *Instruments of Planning: Tensions and Challenges for More Equitable and Sustainable Cities* (Routledge, 2016) 142.

⁸⁸ Chiodelli and Moroni, n 87, 422.

⁸⁹ Patricia Machemer and Michael D Kaplowitz, "Transferable Development Rights: A Market-based Land Use Control" in Michael D Kaplowitz (ed), *Property Rights, Economics and the Environment* (Jai Press, 2000) 143.

⁹⁰ Margaret Giordano, "Over-stuffing the Envelope: The Problems with Creative Transfer of Development Rights" (1987/1988) 16 *Fordham Urban Law Journal* 43, 47. See also Daniel J DePasquale, "A Pragmatic Proposition: Regionally Planned Coastal TDRs in Light of Rising Seas" (2016) 48 *Urban Lawyer* 179; Robert A Johnston and Mary E Madison, "From Landmarks to Landscapes: A Review of Current Practices in the Transfer of Development Rights" (1997) 63 *Journal of the American Planning Association* 365.

⁹¹ See *Penn Central Transport Company v City of New York* 438 US 104 (1978). For further discussion, see Giordano, n 90; DePasquale, n 90.

⁹² Edwin H W Chan and Jun Hou, "Developing a Framework to Appraise the Critical Success Factors of Transferable Development Rights (TDRs) for Built Heritage Conservation" (2015) 46 *Habitat International* 35, 41.

⁹³ Leonie Janssen-Jansen, "Space for Space, a Transferable Development Rights Initiative for Changing the Dutch Landscape" (2008) 87 *Landscape and Urban Planning* 192.

⁹⁴ Ben P Harman, Rick Pruetz and Peter Houston, "Tradeable Development Rights to Protect Peri-urban Areas: Lessons from the United States and Observations in Australian Practice" (2015) 58 *Journal of Environmental and Management* 357; Tom Daniels, "Purchasing Development Rights for Protect Farmland, Forests, and Open Space" in Michael D Kaplowitz (ed), *Property Rights, Economics and the Environment* (Jai Press, 2000) 123. See also Chan and Hou, n 92; Johnston and Madison, n 90.

Levinson refers to economic benefits in pollution control.⁹⁵ Notwithstanding these actions, Chiodelli and Moroni have soberly observed that “the wide and varied potential of this device remains largely to be explored”.⁹⁶ More recently, Nellerhoe follows the moves of TDRs to coastline management while exploring varying approaches.⁹⁷

In Australia, TDRs arrived significantly later than in the United States. This is due to Australian statutory planning having been nurtured by pre-1947 British zoning regulations, as noted earlier. Yet creative plans developed during the late 1980s and 1990s, well before the stranglehold of LEPs by the LEP Template in 2006. Local planning instruments were then traditionally shaped to retain heritage buildings. This is supported by Bindon, who saw TDR as a useful planning device but “not the only tool”.⁹⁸ The pre-eminent example is Sydney City, where the 1971 *City of Sydney Strategic Plan* first introduced “heritage incentives in the form of Transferred Development Rights”.⁹⁹ While the 1971 document had “no formal legal status”,¹⁰⁰ by 1982, 43,000 sq m of floor space had been transferred through 15 development approvals.¹⁰¹ Currently, the City Centre or City Edge zones are subject to the City of Sydney Heritage Floor Space (HFS) Scheme under cll 6.10 and 6.11 of the Sydney LEP 2012, and cl 5.1.9 of the Sydney DCP 2012.¹⁰² Once conservation works to the heritage item have been completed, the owner earns virtual HFS, which can then be transferred to receptor site within the City as part of a condition of development consent granted over the heritage item. However, Daines regards HFS as having met limited success.¹⁰³ Despite this, TDRs were never developed as a panacea to maintain and protect historic buildings but merely one tool of those available in the planner’s toolbox. This approach was applied in attempt to protect agricultural land from urban growth at the edge of Adelaide¹⁰⁴ and avoiding small plottage subdivisions on valuable fertile land in Wellington, located in midwestern New South Wales.¹⁰⁵ In 2004, Williams presented a more comprehensive study of TDRs in NSW in addition to global examples;¹⁰⁶ however, his update in 2012, illustrates growing caution towards TDRs.¹⁰⁷ In addition to case law partially causing “legal uncertainty” regarding TDRs in EPIs,¹⁰⁸ there is the iron grip of the LEP Template.

Notwithstanding this, the use of coastal TDRs or similar planning tools are emerging. Robb et al refer to the use of TDRs to encourage coastal adaptation measures and “[l]and swaps” in Western Australia but note concerns raised by local planning officers.¹⁰⁹ Again in the coastal context, Foerster et al in

⁹⁵ Aril Levinson, “Why Oppose TDRs? Transferable Development Rights Can Increase Overall Development” (1997) 27 *Regional Science and Urban Economics* 283.

⁹⁶ Chiodelli and Moroni, n 87, 422.

⁹⁷ Emily M Nellerhoe, “Coastal TDRs: A Solution for Shifting Sands on Folly Beach?” (2016) 44 *Coastal Management* 223. See also DePasquale, n 90.

⁹⁸ Julie Bindon, “Transferable Development Rights” (1992) 30 *Australian Planner* 136, 141. See also Catherine Arnold, “Transferable Developments Rights – A Planning Tool for the Preservation of Heritage Buildings” (1992) 9 *EPLJ* 458.

⁹⁹ John Punter, “Urban Design in Central Sydney 1945–2002: Laissez Faire and Discretionary Traditions in the Accidental City” (2005) 63 *Progress in Planning* 11, 47.

¹⁰⁰ Punter, n 99, 45.

¹⁰¹ Punter, n 99, 59.

¹⁰² Sydney LEP 2012, cll 6.10–6.11; Sydney DCP 2012, cl 5.1.9.

¹⁰³ Douglas Daines, “Transferable Development Rights” (1992) 30 *Australian Planner* 178.

¹⁰⁴ Elmer Evans, “Transferable Title Rights” (1993) 31 *Australian Planner* 29; Harman et al, n 94, 363–367.

¹⁰⁵ Syd Craythorn, “Rural Consolidation” (1994) 31 *Australian Planner* 212.

¹⁰⁶ Peter Williams, “Use of Transferable Development Rights as a Growth Management Tool” (2004) 21 *EPLJ* 105, 116–121.

¹⁰⁷ Peter Williams, “The Curious Case of Property Rights in the NSW Planning System and Its Reluctance to Adopt Transferable Development Rights” (2012) 17 *EPLJ* 61.

¹⁰⁸ See NSW Land and Environment Court’s decisions in *Meriton Apartments Pty Ltd v Minister for Urban Affairs and Planning* (2000) 107 *LGERA* 363; *Leighton Properties Pty Ltd v North Sydney Council* [1998] NSWLEC 39, cited by Williams, n 107, 73–75.

¹⁰⁹ Ashley Robb et al, “Planning for Coastal Erosion and Inundation in Western Australia: Practices and Perceptions from the Local Level” (2017) 34 *EPLJ* 142, 155–156.

confronting the growing obstinacy in local plan-making, recommend adaptive methodologies to set up “financial incentives or land buybacks”.¹¹⁰ Kellett et al support “land swaps to allow coastal residents to relocate further inland”.¹¹¹ But more attention needs to be given to potential advantages of coastal TDRs to attract policy and legislative support. One option is radical intervention in the property market to protect the value of coastal property through TDRs as an alternative to financial compensation. Given the prospect of extensive litigation seeking substantial compensation from government, especially at the State and local government levels, TDRs may substantially assist the limited public purse. The limited ability or even unwillingness of government to provide such compensation necessitates the conceiving of alternative property rights-related tools. TDRs represent a transfer of prospective compensation liability from government to the market place, obviating any cost wherever possible to government. They can crystallise the development potential of vulnerable properties with the development potential transferred to other less impacted sites in the coastal zone or nearby. The original vulnerable sites are transferred at no cost to government for risk protection purposes as a condition of the grant of TDRs.

CASE STUDY: COLLAROY BEACH, NSW

As touched upon earlier, the beachside suburb of Collaroy falls within the new Northern Beaches Council. It is an expensive beachside dormitory suburb, approximately 22 km north of the Sydney CBD. Collaroy was originally established for low-density/low-rise housing and, more recently, high-rise apartment buildings have replaced many of the older detached dwellings. The name of the suburb dates back to 1881 when collier SS Collaroy ran aground on the nearby beach during ironically, a storm event. Former Warringah Shire Council, which encompassed Collaroy, was established in 1906 under the *Local Government Act 1906* (NSW),¹¹² when the NSW Government enforced municipalisation across a sizeable part of the State. Collaroy is now a growing Sydney suburb that faces both development pressure but has suffered from severe erosion on the frontal sand dunes and the beach.¹¹³

On 5 June 2016 and continuing into the following day, Collaroy beach was the subject of a significant storm. Its impact resulted in the erosion and loss of an estimated 12,000–14,000 cubic metres of beach sand when two East Coast Lows crossed the Collaroy coast during a King Tide event when wind speeds were estimated at 52 knots.¹¹⁴ The erosion of the sand caused the beach areas to advance into land held as private property, causing damage to structures and landscaped yard areas. This damage was readily visible and widely reported in the local and international media.¹¹⁵ The storm highlighted the difficulties of allowing flexibility in an environment of a changing climate within a rigid legal framework.

In 1867, the frontal sand dune between Stewart and Ramsay Streets comprising a 100 m frontage to the Tasman Sea was alienated by the Crown¹¹⁶ permitting the subsequent construction of fishing shacks

¹¹⁰ Foerster et al, n 24, 482, 484.

¹¹¹ Jon Kellett, Jacqueline Balson and Mark Wester, “Sea-Level Rise and Planning: Retrospect and Prospect” (2014) 51 *Australia Planner* 203, 207.

¹¹² Northern Beaches Council, n 23. Before the *Local Government Act 1906* (NSW), there was an opportunity for permissive local government pursuant to colonial statutes in 1858 and 1867: see F A Larcombe, *The Stabilization of Local Government 1858–1906 in New South Wales* (Sydney University Press, 1976). This did not occur in the Warringah subregion.

¹¹³ Bonyhady, n 15, 84.

¹¹⁴ Angus Gordon, Greg Britton and Todd Dickinson, “Collaroy Beach 2016 – D Day Storm – Lessons Learnt” (Paper presented at the 25th NSW Coastal Conference, Coffs Harbour, 2012).

¹¹⁵ See, eg, Megan Levy, Ava Benny-Morrison and Daisy Dumas, “Sydney Storm: Erosion Swallows 50 Metres of Collaroy, Narrabeen Beaches”, *Sydney Morning Herald*, 7 June 2016 <<http://www.smh.com.au/environment/weather/sydney-storm-erosion-swallows-50-metres-of-collaroy-narrabeen-beaches-20160606-gpd2ob.html>>; Amanda Hoh, “NSW Weather: Collaroy Swimming Pool Collapses as Giant Waves Hit Beachfront Houses”, *ABC*, 6 June 2016 <<http://www.abc.net.au/news/2016-06-06/nsw-weather-large-waves-hit-collaroy-coast/7479846>>; Debbie Schipp and Megan Palin, “Is the Australian Dream of a Beachfront Home Really Worth It?”, *news.com.au*, 8 June 2016 <<http://www.news.com.au/national/is-the-australian-dream-of-a-beachfront-home-really-worth-it/news-story/37842853b935d2e78faa4d4f7deb2ff2>>.

¹¹⁶ Deposited Plan 111254 dated 8 December 1867, known as the Mount Ramsay Estate at Narrabeen.

and modest holiday homes. Over time, these initial buildings have been replaced with increasingly substantial residential properties, some of double storey construction, notably with planning approval. Collaroy beach was significantly impacted by the previously mentioned storm event of 5–6 June 2016; however, this was not the first significant damaging storm in this area. There have been some five prior such storm events over the past century where the King tides of May and June have coincided with East Coast Lows. In the face of increasing incidents of such storm events coupled with anticipated sea level rises, political pressure upon local authorities has increased. Arguably, a prudent approach would be the removal of private property from the mark of coastal damage and destruction. However, such extinguishment of private property rights would result in the payment of compensation by the State Government.

This article proposes an alternative method of compensation funding via TDRs. This allows payment by private developers wishing to undertake nearby developments with enhanced floor space ratios sourced from vulnerable coastal properties rather than from the public coffers. This proposition draws upon other successful models, such as the existing HFS scheme in operation in parts of the Sydney CBD as noted earlier. Essentially, the use of TDRs in this context effectively privatises the compensation that would ordinarily be paid by the government for such properties. Payment would be garnered from the value of the development rights transferred from the impacted coastal site to a less vulnerable receptor site to be developed to a higher density than would otherwise be permissible.

At Collaroy beach, the council currently has the capacity under cl 4.6 of the Warringah LEP 2011 to permit exceptions to existing development standards,¹¹⁷ a mechanism not dissimilar to TDRs. The Council may approve an increased development potential on certain lands through a transfer of floor space, which obviously carries sufficient property value. Similar to the Sydney CBD HFS scheme, the local council can maintain a register of TDRs transferred and available for transfer.

Usefully, in *Jubilee Properties v Warringah Council*,¹¹⁸ the contribution by the developer to Council resources was valued at \$2,655,500, in return for an increase in floor space above the permitted 24 m height limitation for a mixed use residential development over ground floor retail space at 699 Pittwater Road, Dee Why (directly north of Collaroy) in 2015. The text of the Voluntary Planning Agreement reveals that this contribution permitted the floor space to be increased beyond the approved nine-storey mixed use development consent comprising 85 apartments and four retail/commercial units with a maximum height of 28 m over the top floor residential penthouse, with two levels of car parking accommodating 102 car spaces. The resultant floor space increase yielded a 15-storey mixed use development comprising two basement car parking levels for the seven levels of 129 apartments, 270 sq m of retail space and 260 sq m of commercial office space. The total car parking was to be 175 cars.

In summary, for a payment valued at \$2,655,500, the council accepted an increase in building height from 28 m in an area designated as having a maximum height of 24 m to a proposed building height of 51 m, that is 27 m above the statutory limit set out in the Council's LEP. The floor space ratio for the 1,777 sq m of site, was intended to be increased from the permitted 4.00:1 (as opposed to 4.40:1 for the 2011 approval) to 6.60:1 (or 6.29:1 excluding the areas dedicated to council). This represents an increased building area from 7,108 sq m (1,777 sq m × 4.00) to 11,728.2 sq m (1,777 sq m × 6.60) = 4,620.2 sq m. This equates to \$574.76 per additional sq m of building area, say \$575.00 per sq m. This may be compared to the average rate per sq m of HFS TDRs that apply in the more expensive Sydney City Council area where the average cost of TDRs was \$1,343 per sq m.¹¹⁹

¹¹⁷ Warringah Local Environmental Plan 2011, cl 4.6, is the direct result of the Standard Instrument (Local Environmental Plans) Order (ie the "LEP Template"), introduced on 30 March 2006. The key purpose of this provision is to replace State Environmental Planning Policy 1: Development Standards.

¹¹⁸ *Jubilee Properties v Warringah Council* [2015] NSWLEC 1042.

¹¹⁹ Sydney City Council, *Heritage Floor Space Update, December 2017* (Sydney City Council, 2017) <http://www.cityofsydney.nsw.gov.au/_data/assets/pdf_file/0017/264320/Heritage-floor-space-update-December-2017.pdf>.

By determining the market value of development beyond that which would normally be approved, analysed as a rate per sq m, it is possible to determine the amount of TDR floor space required to recompense dispossessed owners. This article has canvassed how 10 vulnerable coastal private property rights could be extinguished and transferred to public ownership. Excluding transaction costs being additional to the TDR compensation would require transferral of the entire development potential for all 10 impacted Collaroy properties. The floor space required would then be the total value of all properties divided by the rate per sq m value of the TDR. Using this approach, we have utilised assessments of the value¹²⁰ of the impacted properties followed by calculating the TDR sq meterage necessary to provide compensation. The results are set down in the table below.

Address	Value	Available TDR at \$575/m ²
1126 Pittwater Road	\$3,500,000	6,086.96 m ²
1128 Pittwater Road	\$2,875,000	5,000.00 m ²
1130 Pittwater Road	\$2,500,000	4,347.83 m ²
1132 Pittwater Road	\$2,200,000	3,826.09 m ²
1134 Pittwater Road	\$2,700,000	4,695.65 m ²
1136 Pittwater Road	\$3,800,000	6,608.70 m ²
1138 Pittwater Road	\$3,300,000 (est)	5,739.13 m ²
1140 Pittwater Road	\$2,500,000	4,347.83 m ²
1142 Pittwater Road	\$4,000,000	6,956.52 m ²
1144 Pittwater Road	\$4,500,000	7,826.09 m ²
Total	\$31,875,000	55,434.78 m ²

Given the above, with the total estimated value of the 10 impacted properties being \$31,875,000, then applying the value of the TDRs at \$575 per sq m, the total quantity of TDRs required is calculated at 55,434.78 sq m ($\$31,875,000 \div \575.00 per sq m). Arguably, the benefits accruing from TDRs in the above context are that the significant burden of costs associated with the desirable acquisition of vulnerable coastal private property rights can be shifted from the public sector to the private sector. As the broader impact of climate change develops, methods of compensation for land-inundated need to be conceived in a financially sustainable manner from the standpoint of the public coffers.

CONCLUSION

It will be noted that the title of an earlier section of this article uses the word “miasma” in reference to coastal mapping. The word has Greek origins describing a foreboding atmosphere and it was used to explain the infectious or noxious vapours that were believed to cause the bubonic plague in England. The impending collision between climate change and coastal private property rights has all the hallmarks of a miasma, resulting in rapid and profound changes to long settled mapping, survey law and property law.

The world of fixed and inflexible legal property rights is about to meet head-on the reality of a planet of raging changes to climate through rising sea levels and increasingly frequent and violent storm damage. The government will increasingly need to accept further flexibility in private property rights in the 21st century, to accommodate the changes nature will inevitably force upon landowners. The

¹²⁰ Liz Burke and AAP, “Havoc Still to Come as Collaroy Residents Brace for More Damaging Tides”, *news.com.au*, 7 June 2016 <<http://www.news.com.au/technology/environment/havoc-still-to-come-as-collaroy-residents-brace-for-more-damaging-tides/news-story/1b0327d36ed9a74ffca6f9951122c532>>. The assessment of the values of the 10 properties is based upon the reported values in the aforementioned article and also partly upon the opinion of one of the authors: Ken Rayner, FAPI Certified Practising Valuer.

emerging legal challenges of the impact of Climate Change on traditional private property rights is of paramount importance, and the suite of new government tools should include coastal TDRs.

While TDRs cannot be expected to provide a panacea, they can provide a substantial alternative benefit in planning adapting for coastal change. The remaining legal question is whether a clear statutory provision should be inserted into the *EPA Act* and/or the LEP Template. Its articulation should be sufficiently broad to enable local councils to design their own provisions but under the firm guidance of the State Government to ensure wider consistency.

The conundrum remains, however, that for coastal TDRs aiming to assist owners' property damage, the mechanism might be viewed as supporting those who unwisely decide to reside close to the ocean. But for those who bought their properties well before the emergence of coastal engineering as a discipline as noted earlier in the *Egger* case, and were in a position of being reasonably unaware of future property damage, governments and their constituents might be sufficiently kind to provide some form of reasonable aid. The TDR might, however, offer a different methodology with minimal fiscal impact on governments. For this opportunity to proceed, it must be underpinned by close multidisciplinary investigation progressing, towards a new statutory subsystem. Of course, public participation and designing new legal architecture will be paramount. Local planners must then consider fresh means, such as TDRs, in managing our fragile coastline.