



Where will the children play? A personal perspective on sandy beaches

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ABSTRACT

The sandy beaches that fringe much of the world's oceans are the most sought-after venue for recreation and tourism on our home planet. However, the value of sandy shores goes well beyond simple recreation, fun and enjoyment. The social-ecological system comprising the sandy littoral zone has diverse intrinsic values, not just in ecosystem services and as repositories of biodiversity, but also as part of our spiritual and cultural world. In this essay we aim to highlight the inherent beauty of sandy littoral zones as a whole and beaches in particular, through the eyes of celebrated poets. We explore the timeless fascination that beaches have held for people and their immense value in spiritual, cultural, economic and environmental contexts. We touch briefly on how beaches are threatened today by a variety of stressors, which are driven primarily by anthropogenic influences. We draw attention to the requirement to consider the sandy littoral holistically and include the beach, dunes and surf zone, which are tightly coupled systems. Then we conclude by emphasising the need for farsighted and participatory governance that should manage the entire sandy littoral as a whole and be underpinned by sound science. We hope that this essay will promote greater appreciation of sandy beaches and stimulate research focused on providing direction to coastal planning and management, as well as encouraging custodians of the coast to consider a more participatory approach to governance.

*Well you've cracked the sky, scrapers fill the air
But will you keep on building higher
'Til there's no more room up there?
Will you make us laugh, will you make us cry?
Will you tell us when to live, will you tell us when to die?
I know we've come a long way
We're changing day to day
But tell me, where do the children play?
(Lyrics from Cat Stevens (1970) 'Where do the children play?')*

The beaches that fringe much of the world's oceans are the most sought-after recreation venue on our home planet - everyone loves a beach, children especially, it is their favourite place to play. Even the smallest child is fascinated by the wash of waves and the feeling of sand grains between toes and fingers (Fig. 1). This timeless fascination was beautifully captured by Robert Graves a century ago in his famous poem 'The Beach' (1956):

*'Louder than the gulls the little children scream
Whom fathers haul into the jovial foam,
But others fearlessly rush in, breast high,
Laughing the salty water from their mouths -
Heroes of the nursery.'*

What a magical combination beaches provide through the simple interaction between two primal elements, water and sand. This sand at the edge of the sea is in constant restless motion and lacks any biological structures; waves, tides and wind are in full control and any organisms present must move and cope with the constant motion of sand for they cannot change or modify it - even permanent burrows are absent. Indeed, contemplating waves breaking on a beach stirs in us emotions of wonder and awe at the splendour and power of nature exhibited so clearly by these simple ecosystems. Here physical processes predominate and are visible in the form of the never-ending exchange of sand back and forth among beach, surf and dunes. Here nothing is permanent except change, as captured by the poet Edmund Spenser five centuries ago (sonnet 75, 1595):

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*'One day I wrote her name upon the strand
But came the waves and washed it away
Again I wrote it with a second hand
But came the tide, and made my pains his prey.'*

A myriad of poems has been penned about beaches, from before Spenser and extending right up to the present day. In most cases the authors eulogize the pleasures, peace, sublime sensations and joys of a beach visit; undoubtedly, beyond exhilarating recreation, many people experience a beach visit as soothing and refreshing to the soul, even psychologically healing. Perhaps most classic among the many romantic poems about sandy beaches is *'Evening on Calais Beach'* by William Wordsworth (1802) who refers to a walk on the beach with his young daughter:

*'It is a beauteous evening, calm and free,
The holy time is quiet as a Nun
Breathless with adoration; the broad sun
Is sinking down in its tranquillity;
The gentleness of heaven broods o'er the sea:
Listen! the mighty Being is awake,
And doth with his eternal motion make
A sound like thunder—everlastingly'*

'On the Beach at Night Alone' by Walt Whitman (1856) is another classic that shows how Whitman visualizes the scenic beauty on a beach at night:

*'A vast similitude interlocks all,
All spheres, grown, ungrown, small, large, suns, moons, planets, comets,
asteroids,
All the substances of the same, and all that is spiritual upon the same'*

Without a doubt, the value of sandy beaches goes well beyond simple recreation and straightforward fun and enjoyment. Natural environments have diverse intrinsic values, not just in ecosystem services and as repositories of biodiversity, or even as social-ecological-systems, but as part of our spiritual world. After all, the ancients, and even many modern cultures today, worship elements of nature and see 'god' in nature. We recognise here that sandy beaches are more than just scenic and enjoyable coastal ecosystems and attempt to glimpse at their spiritual and cultural values, values that are timeless and transcend cultures

and ages! Nature has a cultural and spiritual dimension (IUCN-CSVPA, 2022) and beaches personify this more than most ecosystems.

This spirituality, i.e., the transcendent significance of natural features, can put people in touch with a deeper reality, something greater than themselves. Thus, natural environments can have spiritual significance as places of inspiration and symbols of identity, even for people who do not consider themselves religious. This spiritual connection that people may experience in nature can give meaning and vitality to their lives and motivate them to revere and care for the environment. There is a sense of peace and serenity conferred by a beach, which is referred to widely in the popular media, especially with reference to the connection with the four elements: sand, water, wind and sun (= fire). There is also recognition of the meditative feeling invoked by the rhythmic beat of the waves on the shore, harking back to the mother's heartbeat experienced while in the womb, coupled with the comforting warmth of the sand, representing mother earth.

The cultural dimensions of sandy beaches can also be seen in numerous contexts and quotations that are often taken at face value so that the implied importance of beaches is overlooked. For instance, in Australia, where sandy beaches are the most popular and iconic recreational venue and essential to the Aussie outdoor lifestyle, beaches may be seen to personify the national spirit of democracy and equality: everyone has access to the beaches and is equal there. Many sports and recreational activities take place at the beach, and there are also more passive activities that include sunbathing, watching the waves, bird-watching, and observing iconic species nesting (e.g., turtles, shorebirds). Sandy beaches also have high legacy value that future generations should have the privilege of experiencing, including aesthetic experiences that provide artistic inspiration and appreciation of nature. There are, moreover, several elements that have symbolic, sacred or religious meaning. A number of ceremonies and rituals are performed on beaches, and certain specific sites may be sacred to some communities.

Sandy beaches are exceptional in providing all of the cultural services classified by CICES (Common International Classification of Ecosystem Services) (Haines-Young and Potschin, 2018). For example, sandy beaches promote health, recuperation and enjoyment as well as intellectual, spiritual, symbolic and other interactions through both active and passive activities; and they have an existence or bequest value (Harris and Defeo, 2022). Further, the economic value of sandy beaches



Fig. 1. Their favourite playground: Australian youngsters enjoying sand and water at the edge of the sea during an organized sports event. With a population heavily concentrated around the coastline and a climate conducive to an outdoor lifestyle, beach recreation is at the core of Australian culture. Photo by Anton McLachlan.

is immense (Houston, 2018): beaches are the single biggest driver of tourism worldwide and are a key determinant of coastal property values. Many coastal economies would not exist were their beaches removed. Beaches are an integral part of the modern global culture and lifestyle, eagerly sought after as places of relaxation, serenity, recreation and fun, as well as being exploited for sustenance and materials. Until recent times wide flat beaches were even used as highways, for example in New Zealand. Our prehistoric ancestors combed the shore for food and many subsistence and small-scale beach fisheries are continuations of this today.

Yet subsistence is only a small part of our use of beaches and the joys of beachcombing extend also to collecting items of beauty and interest, even art. Who has not, as a child, thrilled at the pleasure of picking up beautiful shells on the beach? Anyone who has enjoyed beachcombing knows that sandy beaches are graveyards for the shells of marine molluscs (and other forms with calcareous skeletons) whose soft parts have gone. Shells wash up whole or as fragments to be ground down and make up a major component of the sand on most beaches. Moreover, beaches are the final resting places for many items in addition to shells. To be sure, beaches may also be considered graveyards for rocks, which weather and end up as sand grains borne to the coast by rivers and then endlessly sorted and resorted on the shore. This grinding down was beautifully captured in Matthew Arnold's (1867) *'Dover beach'*:

*'Listen! You hear the grating roar
Of pebbles which the waves draw back, and fling,
At their return up the high strand,
Begin, and cease, and then again begin,
With tremulous cadence slow, and bring
The eternal note of sadness in.'*

Besides these two main sources of beach sand, weathered rocks and calcareous skeletons, which end on the beach as tiny fragments, beaches also receive the remains of many marine animals cast ashore – seabirds, seals and even whales. Indeed, beaches have also been human graveyards, having witnessed the shedding of much human blood in times past: from the invasions of the 'sea peoples' terrorising Mediterranean shores three millennia ago, Viking raids from longboat landings on European beaches a millennium ago and, more recently, troops landing on beaches, such as Gallipoli during the First World War and Normandy during the second, and many other seaborne invasions across continents over the centuries. A brief glimpse of this loss of human life is conveyed by Kenneth Slessor's (1944) *'Beach burial'*, which laments the bodies washed up on the beach in North Africa during the Second World War, the last verse:

*'Dead seamen, gone in search of the same landfall,
Whether as enemies they fought,
Or fought with us, or neither, the sand joins them together,
Enlisted on the other front.'*

There is a poetic feel about this sense of the sandy beach as a kind of graveyard where everything is eventually ground down to grains and levelled by the restless motion of waves, tides and wind. It reminds us that nothing can withstand the forces of nature forever. Beaches can even be graveyards for houses built on dunes too close to the sea, which may be lost during major storms, such as are increasingly occurring due to climate change. This is reminiscent of the biblical parable of the destructive fate of the house built on sand (Matthew 7:26–27), where Jesus refers to those who ignore wise advice – are we guilty of ignoring such climate advice today?

Contemplating beach sand calls attention to the fact that beaches even have metaphorical value, especially with allusion to the grains that constitute them. There are innumerable references in the literature to the value of small things, emphasising that every individual counts, even a single grain of sand. The lyrics of Nobel Laureate Bob Dylan's (1981) beautiful *'Every grain of sand'* comes to mind, the last verse:

*'I hear the ancient footsteps like the motion of the sea
Sometimes I turn, there's someone there, at times it's only me
I'm hanging in the balance of the reality of man
Like every sparrow falling, like every grain of sand'*

Amongst many others, William Blake's (1803) *'Auguries of Innocence'* is perhaps most widely quoted:

*'To see a world in a grain of sand
And a heaven in a wild flower,
Hold infinity in the palm of your hand
And eternity in an hour.'*

In contrast to statements extolling the value of each individual grain, we also find many references to the abundance of sand grains, e.g. the biblical reference to Abraham being told his descendants will be as numerous as the grains of sand on the seashore (Genesis 22: 17). Another aspect of the abundance of sand grains to ponder is the Sorites paradox (sorites meaning a heap and the paradox being attributed to the Greek philosopher Eubulides of Miletus). The question is: how many grains must be removed from a heap of sand before it is no longer a heap? If one grain at a time is removed it is impossible to say because there is a continuum between a heap and a single grain. So, we could ask how many sand grains could be removed from a beach before it is no longer a beach. Just to put this in context, a handful of sand is said to contain about 10 000 grains! In addition, this paradox highlights the idea that small changes can have big consequences if, at one point along the continuum, removal of one more tiny grain could make the pile of sand no longer a heap or the beach no longer a beach.

Undoubtedly, sandy beaches provide immense value to us as individuals and communities in spiritual and cultural ways, ways not easy to define and impossible to quantify, yet vitally important for our psychological wellbeing. Of course, these cryptic values are not all that beaches provide for us, there are plenty of more tangible and quantifiable ways in which beaches provide vital support to the integrity of our broader environment, such as through ecosystem services. Indeed, sandy beaches provide an extraordinary amount of ecosystem services in addition to those alluded to above: provisioning services include subsistence and food through clam- and fin-fisheries, sand and other materials for construction, and water extracted from groundwater aquifers; regulation and maintenance services include nutrient cycling, air quality and waste treatment. Most critical though is coastal protection: beaches dissipate storm waves, giving up their sand to widen the surf zone; and foredunes also come into play during extreme storms, yielding their sand reservoir to widen the surf even further and thereby extend the zone of dissipation. This sand loss is slowly replaced during calms, thus repeating the endless cycle of sand storage and exchange among the three linked compartment of the sandy littoral: dunes, beach and surf. To be sure, coastal protection, is the most important function of the sandy shore, a function only possible when its constituent elements are intact and interacting: the beach as the fulcrum in the centre, flanked by the surf zone, which takes sand to dissipate wave energy during storms and returns it during calms, and the foredunes, which hold the critical sand reservoir by means of sensitive vegetation. But we should not take these ecosystem services of the sandy littoral for granted.

The ecosystem service function of beaches, even their very presence, is challenged by many human-induced stressors, so that sandy beaches are under strain worldwide. Anthropogenic factors, from trampling and recreation to different degrees of urban development and supporting infrastructure, simultaneously undermine the social-ecological status of beaches, impairing their capacity to provide ecosystem services. Even the United Nations has recognised this, reporting on the crisis of global sand loss for construction, totalling 50 billion tons per year and mainly related to population increase and urbanisation (UNEP, 2019). In addition, climate change threatens beaches through sea level rise, warmer temperatures and associated storminess, resulting in erosion and beach retreat landwards. Therefore, two opposing forces constrict



Fig. 2. Coastal squeeze: constriction of the beach and dune zones by rising sea level from the ocean side and encroaching human development from the hinterland. An extreme example from Camboriú, Brazil. Photo by Andrew Short.

beaches and can lead to their disappearance: recreational, urban, and industrial development encroachment from land, and sea-level rise from the ocean side. The effects of all these processes, which eat away at beaches, can be broadly grouped under the term ‘coastal squeeze’ (Fig. 2). As a result, the integrity of the sandy littoral becomes degraded, with substantial long-term losses of ecosystem services, leading to social-ecological collapses as coastal communities are affected (Defeo et al., 2021).

As beaches must be available and accessible to people, there is a need for informed coastal zone management for sustainable beach use everywhere, employing well established principles and tools that include, among others, setback, zoning, environmental impact assessment, and restoration. Especially critical is setting development back from the dunes to allow space for landward retreat. However, perhaps even more important is the vital issue of governance and divided jurisdiction. Positioned at the land-sea interface, beaches are prone to complex governance challenges. Yet, a lack of long-term policies, strategic planning, and strong market forces impose barriers to effective governance. Thus, governance initiatives must scale-up (e.g. climate change) and simultaneously scale-down (urbanisation) to produce timely decisions at adequate scales relative to emerging threats such as coastal squeeze. One solution seems straightforward – prohibiting built infrastructure on sensitive and critical dunes - and the benefits are clear. However, the lucrative value of beaches drives decision-makers to overlook or ignore the risks of the unexpected decline in ecosystem services they provide. The politics of sandy beach management favour continued private and public investment and infrastructure building in the dunes, particularly in developing countries where soft credits are incentivized to promote investment. Beaches then become inefficient in providing benefits, leading to an undesirable state that may be difficult or impossible to reverse. As a result, sandy beach social-ecological system collapses occur worldwide, involving a rapid, irreversible, and substantial loss of identity and capital (Defeo et al., 2021). Such ecosystem losses have strong intergenerational equity implications because future generations will not have the same opportunities as current ones to use and enjoy the services and benefits of sandy beaches. We need to transform this perspective and manage the entire sandy

littoral holistically to secure its conservation and sustainable use.

Past governance failures call for the need to change the structure of authorities that manage the coast and for the implementation of participatory approaches with an active role for civil society (Rodil et al., 2022). This change implies shared action and decision-making where local communities can play a pivotal role, given their sense of belonging and cultural identity with the coast. We are encouraged that international initiatives are now starting to go in that direction. The Escazu Agreement, adopted in March 2018, is the first international treaty in the world to include provisions on the rights of environmental defenders, providing full public access to environmental information, environmental decision-making, and legal protection and recourse concerning environmental matters (United Nations, 2018). It also recognizes the right of current and future generations to a healthy environment and sustainable development. The Escazu agreement is being used to modify the institutional architecture that governs coastal decisions, offering tools for improved policy- and decision-making. This engagement of civil society in a new relationship with the state and the market refutes the false dichotomy between environmental protection and economic development, a dichotomy that has been in place when managing sandy beaches in the past.

Clearly there is more than a grain of wisdom in this far-sighted Escazu agreement. Beaches are simply too precious (Fig. 3) to be left to conventional local authority oversight. Without a doubt, we need to expand this adaptive, precautionary and participatory governance methodology to embrace a holistic view and a culturally and spiritually sensitive approach to appreciating, valuing and managing the beautiful and enduring sandy beaches that fringe the world’s coastlines. And this needs to be based on a scientific understanding of the structure and dynamics of the sandy littoral, science which itself needs to be expanded by ongoing research focusing on sustainability, conservation and spatial planning. Otherwise, one day our descendants may need to rephrase the Sorites paradox to question the consequences of removing one more grain from the sand at the edge of the sea by asking:

‘Where will the children play?’



Fig. 3. A pristine subtropical beach, South Africa, showing the three-linked compartment of the sandy littoral: dunes, beach and surf. Photo by Linda Harris.

CRediT authorship contribution statement

Anton McLachlan: Conceptualization, Supervision, Writing – original draft, Writing – review & editing. **Omar Defeo:** Conceptualization, Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

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