



How Might Climate Change Affect Island Culture in the Torres Strait?

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ABSTRACT

The Torres Strait Islands are frequently 'left off the map' in research on biophysical change in Australia. There are few observational data sets from which modelling work or inundation studies can be performed—even though these communities may be facing imminent threats to their existence. Some of these islands are only a metre or two above local mean sea level; and in the last two years several have suffered major inundation incidents due to a combination of king tides and strong winds. Most of these islands have inadequate infrastructure, health services and employment opportunities. This social context is highly significant in terms of these communities' resilience to climate hazards because social and economic disadvantage reduces their ability to cope and their capacity to adapt to rapid environmental change. This concern is compounded by a cultural issue not normally considered by natural scientists working on identifying climate impacts in human settlements. Many Islanders connect the health of their land and sea country to their mental and physical wellbeing and, more broadly, their cultural integrity. Therefore, direct biophysical impacts such as rising temperatures, extreme weather events or secondary impacts resulting from these biophysical changes are likely to have significant indirect impacts on the social and cultural cohesion of these communities. In the near term, projected changes could affect subsistence hunting as well as commercial fishery operations with significant nutritional, economic and cultural ramifications. Similarly, change in rainfall could exacerbate existing pressures on potable water supplies unless significant anticipatory planning is initiated to reduce this climate related risk. In the longer term, the very existence of *Ailan Kastom* (Island Custom) may be threatened if projected sea level rise in combination with extreme weather events increases the frequency and/or severity of inundation incidents and necessitates relocation from the islands. In conclusion, highly participatory adaptation planning is vital to reduce climate risks and their subsequent impacts on Islanders' cultural integrity in the mid to long term.

1. HOW MIGHT CLIMATE CHANGE AFFECT ISLAND CULTURE IN THE IN THE TORRES STRAIT?

1.1 Introduction

The predicament of Islanders on the mainland is that if their society can survive at all, it is only through the conscious perpetuation of island custom and the continual monitoring of its practice. The Strait does not have to worry about custom; the society of Islanders there remains axiomatic as long as they are in occupation of their ancestral islands and are living off resources which, whatever the legality, are theirs by customary right.
– Beckett 1987

Climate change will impact communities in the north of Australia in a number of ways. On low-lying islands, such as those in the Torres Strait, projections of rising sea levels and an increase in extreme weather events are causing increasing concern amongst Islander communities. A range of activities are currently being carried out to improve emergency management plans and to reinforce and extend sea walls to mitigate these impacts; but for the longer term, relocation strategies need to be discussed by Islanders so they can maximise their participation in any decision-making and strategic planning process.

This long term thinking is paramount because relocation off the islands would be fraught with a variety of social, cultural and economic difficulties. Islanders have consistently expressed their belief that moving off their islands is an action of last resort.¹ As Beckett suggests, the strength of Torres Strait Islander culture is intimately connected to (ideally living on) their country and being engaged in traditional activities and cultural practices rooted in their environment.

This paper acknowledges the dynamic nature of any cultural practice, but seeks to explore whether the adherence to *Ailan Kastom* might be compromised by relatively rapid adjustments Islander societies may make in engaging in anticipatory adaptation strategies developed to reduce climate risk. The aim of this paper is to initiate debate, further mainstream interdisciplinary research and expand policy making discussions. Such expansion needs to include locally specific impacts on particular under-represented subsets of the Australian population which are likely to be disproportionately impacted by climate change.

1.2 Geography and demography of the Torres Strait

Between the tip of Cape York and the southerly coastline of Papua New Guinea, the Torres Strait region encompasses about 48,000km² of shallow open seas. There are about one hundred and fifty islands that have highly complex ecosystems and terrestrial biodiversity, although the full extent of this diversity is not known because of a lack of systematic surveying (Bessen 2005). Approximately 8,000 Indigenous people live on seventeen of these islands, comprising about twenty percent of Australia's total Torres Strait Islander population (Arthur and Morphy 2005). There are also Aboriginal people, the Kaurareg, the traditional owners living on the inner island archipelago. The inner island group makes up one of the five 'groups' of inhabited islands, many of which have been inhabited for thousands of years. The inhabited island groups are: the eastern volcanic islands (Ugar, Erub and Mer), northwestern islands (Boigu, Dauan and Saibai), central islands (Iama, Masig, Poruma and Warraber) near western

¹ The Torres Strait Islands have a particular significance for the protection of Indigenous Australian culture and land rights more widely. In 1992, the High Court decided in favour of the traditional owners of Mer Island in what is known as 'the Mabo case'.

islands (Mabuiag, Badu and Moa) and inner islands (Kiriri, Waiben, Muralug and Ngurapai) (see Figure 1).

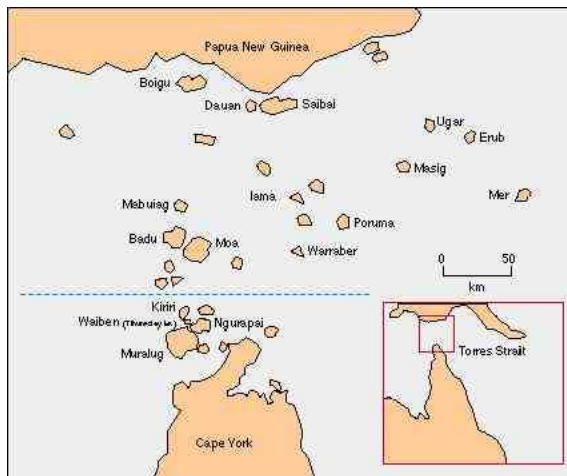


Figure 1 Inhabited Torres Strait Islands

The Indigenous inhabitants of the Torres Strait are culturally and linguistically diverse. Torres Strait Kriol is spoken throughout the islands. The Meriam speaking people live on the high volcanic northeastern islands, while speakers of Kala Lagaw Ya and Kala Kawa Ya live in the low-lying central and northwestern islands. In the past, Torres Strait Islanders were economically and socially linked through an extensive maritime trading network between the islands; with Papua New Guinean villages, and Aboriginal communities on Cape York (Lawrence 1998). Oral histories, songs, dances and place names are still used to preserve and celebrate memories of ancestors and to reinforce bonds between people and their land and sea country (Shug 1999).²

1.3 Culture: Ailan Kastom

Islander culture, or *Ailan Kastom*, refers to a distinctive Torres Strait Islander culture and way of life, incorporating traditional elements of Islander belief and combining them with Christianity (Sharp 1993).³ This unique culture permeates all aspects of island life and is recognised by State and Commonwealth agencies through enshrinement in the *Torres Strait Islander Land Act 1991 (Qld)*.⁴

Ailan Kastom governs how Islanders take responsibility for and manage particular areas of their land and sea country; how and by whom natural resources are harvested, and allocation of seasonal and age-specific restrictions on catching particular species (Johnson 1984; Mulrennan and Scott 1999). The strong cultural, spiritual and social links between the people and the natural resources of the sea reinforces the significance of the marine environment to Islander culture (Sharp 1993; Sutherland 1996). One major component of *Ailan Kastom* relates to the role of turtle and dugong, which have great significance as totemic animals for many Islanders (DEH 2005); (Marine and Coastal Committee 2005).

² More recent history including early pearl-shell and bêche-de-mer fishery work is also considered as an integral part of TSI heritage Shug D (1999) Changes and Challenges in Traditional Fisheries of the Torres Strait. In 'Marine Environmental Politics in the 21st Century'. Berkeley, USA

³ The London Missionary Society entered the Torres Strait in 1871.

⁴ Defined as: "the body of customs, traditions, observances and beliefs of Torres Strait Islanders generally or of a particular group of Torres Strait Islanders, and includes any such customs, traditions, observances and beliefs relating to particular persons, areas, objects or relationships" (Section 2.02 of the *Torres Strait Islander Land Act 1991 (Qld)*).

The ongoing significance of dugong and turtle is evident as they figure prominently in contemporary art, stories and ceremony. Much of the recently produced artwork by Island artists, such as Dennis Nona and Billy Missi, reflects the importance of these animals today. These artworks are significant vehicles for the reinforcement of cultural practices and for recording ancestor stories.

The central role of these animals is also reflected in many of the local names for island features. Features of rock formations relate to story places (Dews, David *et al.* 1997), for example on Mer, certain rock and land formations are associated with the dugong. There are two 'dugong stones' on Boigu at the southern end of the island. These stones are considered to have properties that ensure the abundance of dugongs in the area (Dews, David *et al.* 1997). In the past, not only was hunting dugong a ritualised activity; but the ritual treatment of dugong bones, especially skulls, was practiced to increase hunting success. Midden deposits found on some of the islands are of significant cultural heritage for the Islanders (McNiven and Feldman 2003). Shells arrangements are often also associated with ritual sites, although due to the limited nature of heritage assessments on many of the islands to date, little documented information about them exists (David, Crouch *et al.* 2005). On the northeastern islands, stone fishtraps can still be seen extending out into families' territorial waters (see Figure 2).



Figure 2 Fish traps on Erub Island (photo credit: Donna Green)

Cultural heritage maps included in the ARUP natural hazards report indicate the vulnerability of most of the mapped cultural heritage sites to storm surges (ARUP 2006) Appendix G). These maps indicate the proximity of graveyards, monuments and sacred sites on several of the islands to areas susceptible to storm damage. Although climate change impacts may comprise only a very small component of the total impact of a storm surge (through, for example, sea level rise or increased cyclone intensity), given the extreme vulnerability of these sites, any additional factor affecting the area inundated may have very serious consequences.

Islanders depend to varying degrees on sea food for protein including: shellfish, fish, turtle and dugong (Johannes and MacFarlane 1991). Dugongs are found primarily in the western side of the strait where there are large sea grass beds, while turtles are found throughout the islands (Beckett 1987; Marsh, Harris *et al.* 1997). Despite catch restrictions, there are concerns that the catch rate for some key species in the Torres Strait may not be sustainable. Illegal fishing or excessive catch of commercial species by non-Islanders is likely to be a significant factor in the decline in these population numbers (Dennis, Prescott *et al.* 2006). While breeding grounds for both animals are, however, not restricted to the islands there is reasonable concern that habitat loss (reduction in sea grass beds and turtle nesting beaches in the Northern Territory and further south of Queensland) from climate change may result in reduction in the number of these animals. The significance of their decline in numbers has recently been recognised and a multi-million dollar activity, 'the Turtle and Dugong project' run by the North Australia Indigenous Land and Sea Management Alliance, has been created to research the problem and find ways to promote their sustainable harvest and management (Tropical Savannas CRC 2004).

Traditional hunting techniques using spear or harpoon are an important expression of Islander culture, as is the preparation and sharing of dugong and turtle meat (Johannes and MacFarlane 1990). The non-edible parts of the animals are also sometimes used to make items of cultural significance (Beckett 1987; Beckett 1990). In addition to subsistence hunting and

commercial fishing, gardening and trading relationships with villagers from Papua New Guinea all still continue to play a role in many Islanders' lives (Dennis, Prescott *et al.* 2006). Community gardening on the western and eastern Islands still produce yam and other root crops, bananas and wild herbs. Coconut palms still grow on the central islands.

1.4 Regional climate change projections

Biophysical changes modelled for the Cape York peninsula serve as approximate guides to broad trends for temperature and rainfall in the TSI (Green and Preston 2006). Climate projections for the Cape York region suggest temperature increases of the order of 1.3-1.4°C by 2050 and rainfall increases or decreases of up to two percent (Figure 3).⁵ while global average sea level rise is projected to be between 9 and 88 cm by 2100, sea level rise around some areas of the Australian coast and the Pacific region, has recently shown short term larger-than-average variation (White, Church *et al.* 2005). It is the impact of sea level rise in combination with extreme weather events leading to inundation and erosion that is of most concern for the TSI.

Storm surge modelling has not been performed for this region of Australia. There are very limited tidal records, these limitations are compounded by concerns that some topographic data are not accurate. Given these constraints, identifying climate impacts for this region is, not surprisingly, difficult.

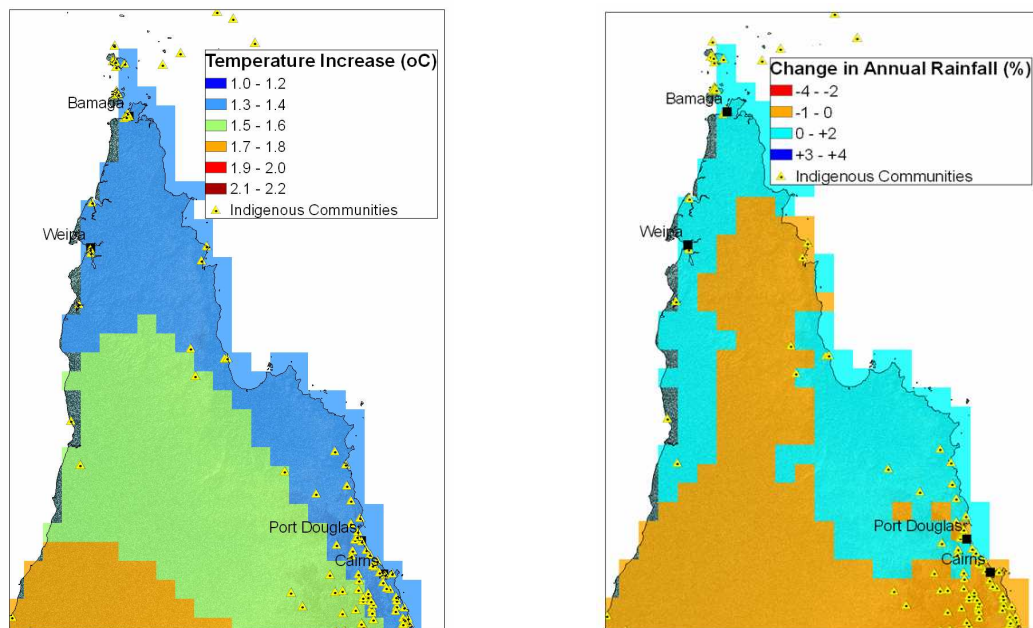


Figure 3 Projected change in average annual temperature and rainfall for Cape York and the Torres Strait region, 2050 (Green and Preston 2006)

Tropical cyclones tend not to directly affect the Torres Strait as most tropical cyclones track further south of the islands. However, even low intensity, relatively distant cyclones can create problems for some of the islands when the storm surges they create occur in conjunction with king tides.

⁵ Projections were estimated using the OZCLIM climate scenario generator and results from a range of climate models and emissions scenarios were averaged to yield a central estimate of future climate change to simplify the discussion of climate impacts. For details of projection methods, models used and data analysis techniques see: URL http://www.dar.csiro.au/sharingknowledge/files/regional_climate_projections2050.pdf

1.5 Indirect climate impacts affecting Torres Strait Islanders

Biophysical change may also indirectly impact Islander culture by affecting human health. These health problems include: increases in heat-related illness, change in the range of disease carrying mosquitoes; increase in extreme weather events; and increases in the risk of water and food-borne illness (Green 2006a). The mental well-being of Islanders who feel that they can no longer predict seasonal change is another factor that needs to be considered in any assessment of Islander health. Given the close cultural connection between the natural environment and Islander culture, habitat change that impacts significant fauna (for example, reduction in turtle nesting beaches, migratory bird foraging or sea grass bed decline) is likely to affect Islanders' mental well-being.

On several of the islands, graveyards are located close to the shoreline. Many of these culturally significant areas are now subject to regular inundation at high tides (see Figure 4). During the inundation incidents in 2006, the graveyard on Warraber was washed out, causing much community distress (Harold Pearson pers. comm. Feb 2006). The graveyard on Saibai was similarly affected.



Figure 4 Sandbagged graves on Saibai (photo credit: Donna Green)

Plant and animal biodiversity on the islands is likely to be impacted by climate change. Shifts in marine conditions, eg a change in sea surface temperatures or acidity; a change in the distribution of mangrove/swamp areas; or reduced abundance of sea food may reduce the amount of subsistence protein available for Islander consumption – potentially causing economic, cultural and health impacts. One area of great concern is the sea grass beds located in extensive meadows around Thursday Island port, some reef platforms, and in shallower eastern waters of the Strait. Surveys have indicated that there are over 13,000km² of sea grass habitat—highlighting the significance of the region as a feeding ground for turtles and dugong and a nursery area for prawns and tropical rock lobster. Several crayfishers expressed concern over the crayfish industry as they felt it was becoming very unpredictable (Maluwap Nona pers. comm. Feb 2006).

Both surface and ground water resources are likely to be impacted by climate change making resource management in the dry season difficult. In the past, many islands depended on fresh water lenses to provide drinking water, but overexploitation of this resource has caused problems and created the need for water desalination plants on many of the islands (Mulrennan 1992). Rainwater tanks and large lined dams are now used to trap and store water for use in dry season. Many of the islands have already reached the limits of drinking water supply and must rely on mobile or permanent desalination plants to meet demand.

Other problems are likely to include an increase in extreme weather events such as droughts and floods, and an increase in salt-water intrusion into fresh water supplies. Such problems are likely to add to difficulties of Islanders attempting to revive traditional gardening practices. Reduction in these practices has compounded health problems in recent years because of the lack of availability of affordable, fresh vegetables.

A final concern relates to climate impacts on buildings and infrastructure (ARUP 2006). More frequent inundation of coastal areas is likely to erode roads, airstrips and jetties and cause problems with waste dumps, water supplies and sewage infrastructure.

In this respect, adaptation has already been taking place on some of the islands. On Mer, the council is encouraging people to build further inland on higher ground, away from the traditional building area that is very close to the shoreline (Ron Day, pers. comm. Feb 2006). Nearly all of Saibai's houses have been raised on stilts to reduce problems associated with inundation. It is interesting to note that stilt houses were one of the traditional housing designs for the island (see Figure 5 & 6).



Figure 5 Saibai stilt-house, late 19thC (Reproduced by permission of the University of Cambridge Museum of Archaeology and Anthropology #P.1066.ACH1)



Figure 6 Raised Saibai house, 2006 (photo credit: Donna Green)

1.6 Recent inundation incidents

Recent inundations that occurred in July/August 2005 (Mer) and in January/February 2006 (Boigu and Saibai, Poruma, Iama, Masig and Warraber) caused much unease amongst communities some of whom had previously experienced such levels of flooding only once in living memory. The high tides at the start of 2006 that affected the central islands and the northwest mud islands, destroyed sea walls and flooded houses, roads and airstrips for several hours (see Figure 7, 8 & 9). They are documented in (EPA Qld 2006). The most recent natural disaster risk management study highlights the seriousness of repeated incidents of this nature.⁶

⁶ This report qualifies the use of the inundation maps of the islands due to the lack of accurate data ARUP (2006) 'Natural Disaster Risk Management Study.' Brisbane. Appendix D2.



Figure 7 Saibai inundation, Feb 2006 (photo credit: Rick Parmenter)



Figure 8 Sea wall on Saibai after inundation incident, Feb 2006 (photo credit: Donna Green)



Figure 9 Iama Island after inundation incident, Feb 2006 (photo credit: Iama Island Council/ Walter Mackie)

During the July/August 2005 inundation on Mer, a high tide flooded several houses. Several houses had about 60cm of sand dumped at their front door (see Figure 10). In one of the flooded houses, the water partially submerged a child's bed.⁷

⁷ Fortunately the family managed to rescue the child and flee higher ground until the flood waters subsided (Sunny Passi, pers. comm. Feb 2006).

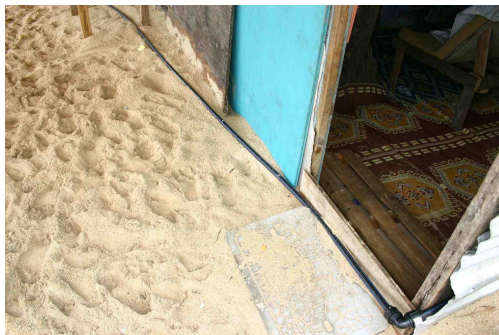


Figure 10 New beach height (outside of a front door) due to sand dumped during high tide (photo credit: Donna Green—photo taken in Feb 2006).

Prior to these recent inundation incidents, the islands' last major floods in living memory occurred at the end of 1947 and in early 1948 when a tropical cyclone combined with high tides to create a storm tide that inundated Boigu and Saibai. At least two elderly Islanders on Boigu still remember this incident. One informant described her childhood memory of how she had to wade through chest high water to get to the church which was built on the highest ground on the island. Most of the community waited at the church for several hours until the flood waters had subsided. In response to this event, some of the community decided to move off the island and onto mainland Australia. Many of the inhabitants of Bamaga community on the tip of Cape York are descendents of these relocated Islanders (Ober, Sproats *et al.* 2000). This relocation, however, did not take account of the potential cultural sensitivities of moving Islander people on to what is now recognised as Aboriginal land. These concerns would need to be at the forefront of any relocation negotiations in the future (Jensen Warusam pers. comm. 2006).

1.7 Island resilience and adaptation options

Small isolated islands are particularly vulnerable to natural disasters: inadequate infrastructure prevents immediate response to or mitigation of the impacts of a disaster. The costs of adapting to climate impacts are high (Tompkins 2005; World Bank 2006) when living is primarily at subsistence level, relying on mainly marine resources. However, this cost is likely to be significantly less than what would be necessary if adaptation activities were not undertaken.

Torres Strait Island communities are vulnerable to climate change in part due to their lowered resilience arising from existing social and economic disadvantage (ABS 2005; Arthur 1999; Marine and Coastal Committee 2005). The population has lower health indicators, fewer educational resources and higher unemployment rates than the Australian average. How best to improve the socio-economic sustainability of the islands has been considered to some degree by non-Indigenous Australians since the mid 1970s (Arthur 1990), but it is only very recently that the impact of climate change on the islands has been discussed in the public arena (Bousen 2006; Minchin 2006). The direct and indirect impacts of climate change on island culture have not been considered to date.

The role of Traditional Environmental Knowledge (TEK) in sustainably managing environments and natural resources found in them is internationally recognised (Calamia 1999; Johannes, Freeman *et al.* 2000; King and Skipper 2004; Krupnik and Jolly 2002; Laidler 2006). Recent recognition of the untapped resource of Indigenous knowledge about past climate change (Lewis 2002; Rose 1996; Strauss and Orlove 2003) could be used to inform adaptation options for these communities. In Australia, Aboriginal and Torres Strait Islander knowledge of environmental change is beginning to be documented (Bureau of Meteorology 2005), and there may be potential in the near future to use this information at the community level to inform decisions supporting culturally appropriate adaptation strategies (Green 2006b).

The need to tailor responses to specific locations means that local knowledge can be invaluable for designing adaptive strategies (Srinivasan 2004). Given there remains a strong body of TEK in Torres Strait Island communities about their land and sea country (Sutherland

1996), any attempt to devise adaptation or mitigation strategies would do well to be informed by these communities' environmental observations. At the recent workshop in 2006, a number of Islanders expressed an interest to begin TEK recording projects in order to be able to better inform adaptation strategies. One traditional owner commented "In the Torres Strait, people still live off the sea and the land. Climate change is forcing communities to respond and adjust to these external influences [which] are causing problems. Impacts that have been observed in recent years are directly affecting people." Further comment from these discussions highlighted cultural differences that related to decision making processes and policy choice. A traditional owner noted "Decisions made without consultation of Indigenous communities can force unwelcome lifestyle changes for them. Westerners don't listen to worries about land—but we want natural protection from climate change that doesn't conflict with traditional ways of life."

1.8 Discussion

Torres Strait Islanders are highly vulnerable to the direct biophysical impacts of natural variability and climate change. Unfortunately there is very little research into the likely scale of the problem, or the timeframe communities have to consider their adaptation options. This problem needs to be addressed through community engagement, allowing decisions to be made through traditional Islander social systems. The significance of climate change relates to its role in compounding *existing* social, economic and environmental problems on the islands. Climate impacts affect the social and cultural dimensions of Islander life because existing disadvantage leaves communities with a low capacity to adapt to change. In recent discussions, some traditional owners have shown concern about the current rate of environmental change, and how it might threaten the security of their homes; land and sea country; livelihoods and cultural integrity.

It is likely that the *Ailan Kastom*, the central cultural driver of the Islanders, will be tested if natural habitats that sustain important cultural animals (such as turtles and dugongs) are affected. In combination with concerns over loss of land due to sea level rise (especially on the northwest mud islands); beach erosion (central islands) and storm surge (northeast islands)—the very identity of these island communities is potentially threatened in the mid to long term. To engage effectively in meaningful adaptation strategies for coping with climate change, efforts should be made to find out whether TEK can inform future environmental management strategies. This approach has the added benefit of empowering communities who own the knowledge to be the primary managers and leaders in decisions about their land and sea country.

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