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Place Character and Climate Change along Australia's Great Ocean Road

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The pace of physical change in Australian coastal towns has increased dramatically in the last decade, particularly near the major metropolitan centers of Sydney, Melbourne, Brisbane, and Perth. This increase can be attributed primarily to what, in Australia, has been termed the “sea change phenomenon”—a migration of urbanites to small coastal communities in search of a relaxed lifestyle in natural and scenic surroundings.¹ One unfortunate consequence of this migration, however, has been a perceived loss of distinctive place character.² Local residents and visitors alike now consider these towns and their surroundings at risk of transformation toward global uniformity.³

In many instances in these settings, the same features instrumental to place character are vulnerable to climate change. Low-lying areas may be inundated; existing coastal infrastructure, such as piers, may be damaged; and natural habitat may be disturbed, leading to loss of biodiversity.⁴ A range of interventions will be needed to counter these effects. Among these, hardscape elements, such as dykes and levees, may help protect against coastal flooding. Softscape initiatives may include the creation of low-lying parklands, the preservation of wetlands, and the stabilization of soils through revegetation.

This article argues that in adapting coastal towns to climate change, features integral to expressions of place—already threatened by increased development—will require special consideration. But this will require a better understanding of cognitive and affective links between the population and local landscape features so that attempts can be made to maintain the most significant of them. Such an action paradigm will demand greater involvement by local residents. Future design and development decisions should not be based solely on professional opinion.

Studies along the Great Ocean Road

The research discussed here derives from an extensive project undertaken to document community perceptions of place along Australia's Great Ocean Road.⁵ The road, in the state of Victoria, winds its way along 250 kilometers of highly scenic and biologically diverse coastline. It also connects a number of small communities—Torquay, Anglesea, Aireys Inlet, Lorne, Apollo Bay, Port Campbell, and Port Fairy—all of which have recently experienced influxes of so-called “sea changers.” Residents of these communities, both long-term and newly arrived, are already complaining that this migration has caused “inappropriate development” that is degrading the local environment. Objectionable impacts include new structures that are incompatible with existing town character and the loss of valued landscape features.

The initial basis of this study was a questionnaire administered by mail in 2004 and 2005 to every household in each of seven Great Ocean Road towns. These towns range in population from as few as 260 (Port Campbell) to as many as 8,000 (Torquay). The questionnaire asked residents of these communities to identify on a map the features and places they felt most strongly conveyed desirable expressions of local character, and to indicate vantage points from which photographs of them could be taken.

The study team then photographed the most frequently identified features from the suggested viewpoints and used these images as stimuli in a series of community photo-rating workshops. In total, 1,344 completed questionnaires were collected, and 324 people participated in the workshops. Participants were asked to rate the compatibility of the depicted features with local character using a seven-point scale. Following the workshops, aggregate mean ratings and standard-deviation values were calculated for each of the depicted features and places, values that allowed an assessment of their degree of perceived compatibility with local character.

Participant groups for both the surveys and the photo-rating workshops were broadly representative of the towns studied. In terms of gender mix and age, the groups reflected community composition as determined by comparison with 2001 census data—with the exception that fewer young people responded. Participants also varied in terms of the length of time they had lived in the towns, but this too was reflective of the general community profile.

Overall, the study found a high degree of consensus with respect to environmental assessment in the towns. Slight variations were found in the responses of participants who had grown up in urban environments versus rural areas, and between those who had lived longer in the towns versus newer arrivals. Those who had a rural background or had lived in the towns longer were somewhat more critical of “out-of-character” features than newer residents and those who had an urban background. Otherwise, the direction of assessment was remarkably consistent.

Generally, features that were rated highest for compatibility with local character were associated with a range of specific physical attributes. For example, smaller houses that had a moderate degree of surface articulation or were screened by indigenous vegetation, regardless of their age, were rated as more compatible with local character than large houses that lacked surface articulation, were boxy in appearance, and/or were not screened by vegetation.



Responding to Climate Change

The second part of the study involved examining the highest-rated place-compatibility features in terms of vulnerability to climate change. Rising sea levels were used as the assessment criterion, assuming an 80 mm rise or greater by the year 2100.⁶ A number of highly compatible features were found to be particularly vulnerable to the threat of rising sea levels and storm surges.

Wetlands were one feature that immediately stood out. Local perceptions indicated that wetland conservation will be particularly important to retaining place character. But wetlands are also valuable for their ability to absorb floodwaters, and they are extremely important in terms of biodiversity. Despite the value of these fragile environments, however, wetlands are poorly protected by planning authorities in Australia. As coastal land for development becomes increasingly scarce, they are continually being encroached upon.⁷

A prime example from the town of Apollo Bay is a proposal to build 537 houses, an eighteen-hole golf course, and a conference center on a wetland area at the mouth of the town's main river.⁸ Local perceptions identified this area as strongly supportive of local character; it may also provide a valuable barrier to storm surges and rising seas. Yet, despite

Top left: The ability of wetlands to absorb stormwater will be critical to mitigating the impacts of climate change. This one, in the town of Port Fairy, provides habitat for a variety of birds, which were also found to contribute to place character.

Top right: The top of this dune at Port Fairy was leveled so that new houses would have ocean views. Boulders have had to be placed at the base to stop erosion; such impacts will only be exacerbated by climate change.

Bottom left: Wetland site of a proposed development for 537 houses, an eighteen-hole golf course, and a conference center at the mouth of the Braham River in Apollo Bay.

Bottom right: This sand dune at Port Fairy has been left in a natural state. This scene was rated as highly compatible with the town's character.



broad opposition by both new and long-term residents, this development may be granted planning approval. Such unsustainable land use needs to be prevented, and where development has already occurred in such areas, adaptive solutions should be considered. Among these may be retrofitting existing structures (e.g., raising them above predicted water levels), relocating them, or abandoning them.

Sand dunes were another natural feature rated highly in terms of place character, and with regard to which land-uses are frequently unsustainable. In particular, new residences are being built on top of coastal dunes, as in the town of Port Fairy. The motivation, of course, is to obtain views of the sea, but in the process the dunes are frequently leveled and their vegetation disturbed. In the future, intact dune systems may provide important protection to coastal communities as they face rising seas and more intense and frequent storm surges. The study also determined that certain geologic features are of great importance to local perceptions of place. Notable among these were the dramatic coastal rock formations at Port Campbell. Such outcrops are continually changed by the force of the sea, and these changes will certainly accelerate in the face of rising seas and more intense and frequent storms. It is unlikely any action can be taken to protect their present form.

Another important geological feature identified by the survey was Henty Reef in the town of Apollo Bay. The

Left: Dramatic coastal rock formations are integral to local perceptions of place in the small hamlet of Port Campbell. These formations are slowly crumbling into the sea. Although this erosion is natural, it will only be accelerated by rising sea levels and more intense and frequent storm surges.

Right: Sea level rise is likely to submerge Henty Reef and its seal colony at Apollo Bay, an important feature of the town's character.



reef, which presently hosts a colony of fur seals, will likely be submerged by rising seas, which will in turn lead to the loss of a significant contributor to place character. In this case one solution might be to construct an artificial reef at a higher elevation as the sea level rises. The appropriateness of such a management activity would need to be seriously considered. As an alteration of nature, it would need to be driven as much by concern for biotic habitat as by the desire to retain a valued attribute of place. In this case, the seals might be better off if they simply moved elsewhere. But such an action does represent the type of response to climate change that might be considered.

Action with regard to a range of manmade structures that were also ranked highly as contributors to place character may also be needed as sea level rises. The docks and boardwalks in the harbor at Port Fairy are one example. Sited where the town's principal river meets the sea, they were built only slightly above existing sea level. The docks and boardwalks can be rebuilt at a higher level, but the way this is done will be critical to community conceptualizations of place character. One approach might be to use similar forms and materials in their redesign.

Recently, a historic pier in the town of Lorne was torn down and rebuilt well above predicted sea-level rise. However, in this case no attempt was made to mirror the design attributes of the original, despite its being identified as important to town character. In Lorne, as in other coastal towns, an integral experience of place involves the darkness one sees looking out to sea at night. Unlike the old pier, the new Lorne pier features a strip of bright lights running its length, which give it the look and feel of an airport landing strip. Such an example gives a good sense of what should not be done in response to climate change.



The Challenge Ahead

As the impacts of climate change become more evident, the towns of Australia's Great Ocean Road will have to balance existing place-based community values against the pressure to accommodate an increasing population of migrants. Such conflict becomes most pronounced when it involves developers, many of them aiming to reap immediate economic gain through environmentally ill-considered projects and property speculation. Their projects frequently conflict with the desires of both longer-term and newer residents seeking to conserve valued local place character.

If such coastal towns are to be sustained as desirable places to live, key landscape features, integral to desirable expressions of place, need to be identified. Impacts of climate change then need to be anticipated so that appropriate planning and design can help preserve them at the same time they are protected from the ongoing impacts of 'sea change' migration.

Notes

1. Ian Burnley and Peter Murphy, *Sea Change: Movement from Metropolitan to Arcadian Australia* (Sydney: University of New South Wales Press, 2004).
2. See, in particular, the report by Nicole Gurrán, Caroline Squires, and Ed Blakely, "Meeting the Sea Change Challenge: Best Practice Models of Local and Regional Planning for Sea Change Communities," National Sea Change Taskforce at the Planning Research Centre, The University of Sydney, 2005.
3. For past research and discussion of community perceptions of place character in Australian coastal towns, see Ray Green, "Form and Meaning in Community Perception of Town Character," *Journal of Environmental Psychology*, Vol. 19 (1999), pp. 311-311; and "Notions of Town Character: A Coastal Community Responds to Change," *Australian Planner*, Vol. 37, No. 2 (2000), pp. 76-86.
4. See the Victorian Coastal Strategy (The State of Victoria, Victorian Coastal Council, 2002).
5. The larger study provides the basis of a forthcoming book by the author, *Coastal Towns in Transition: Local Perceptions of Landscape Change* (Dordrecht, The Netherlands: Springer, expected 2009). That project was funded through an Australian Research Council "Discovery" Grant (2003-2005).
6. Intergovernmental Panel on Climate Change, "Climate Change 2007: Impacts, Adaptation and Vulnerability: Working Group II Contribution to the Intergovernmental Panel on Climate Change," Brussels, IPCC, April 2007.
7. Natasha Vasey-Ellis, "Planning for Climate Change in Coastal Victoria," Master of Urban Planning Thesis, Faculty of Architecture, Building and Planning, The University of Melbourne, 2007.
8. Cited in a recent newspaper article by Royce Millar, "Erosion, Flooding...the High Price of Sea Views," (*The Melbourne Age*, February 16, 2008).

All photos are by the author.

Left: The docks and boardwalks at Port Fairy are likely to be submerged by sea level rise.

Right: The old pier at Lorne, identified by local residents as important to town character, before it was torn down and replaced.