

# **Coastal Vulnerability and Climate Change in Australia:**

Public risk perceptions and adaptation to climate change in  
non-metropolitan coastal communities

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## ABSTRACT

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The degree to which society is potentially vulnerable to the impacts of climate change can be expressed through an assessment of either the biophysical (external) or social (internal) elements at risk. In Australia, the focus to date has been on the biophysical elements, or the level of physical exposure and sensitivity to potential climate change impacts. A greater understanding of the social elements of vulnerability is needed, including society's adaptive capacity. In short, whilst individuals and communities may not be able to control how the climate changes around them, they can influence how they adapt in the face of those changes. One social element, fundamental to adaptive capacity, relates to how individuals perceive the risks of climate change, which can either compel people to, or constrain them from, addressing risk.

Public risk perception is playing an increasingly important role in shaping environmental policy and management response systems and, as highlighted by several Australian and international research priorities, this is particularly relevant at the local level where individual adaptation is context specific. This study has examined public risk perceptions of property owners from two Australian non-metropolitan coastal Local Government areas which contributes to current theoretical understandings of risk, and demonstrates the use of particular methodological approaches in exploring such perceptions, in order to provide clarity to policy-makers on the factors motivating individuals to address and ignore risk.

This study has explored the role that public perceptions of climate change risk have in influencing an individual's willingness to support policy initiatives and consequently adapt to climate change. Utilising representative samples in Rockingham, Western Australia, and Yorke Peninsula, South Australia, data obtained from a mixed-method mail-out survey indicates that the majority of property owners are concerned about climate change, and almost one half believe it is occurring now. An optimism bias was identified, however, whereby many perceived their personal risk as less than that of others in the same community, and they believed strongly in their own capability to adapt. This is despite the fact that many respondents consider climate change impacts as occurring now or likely to occur in the next 25 years, and the fact that they expect such impacts to cause disruption to their lives. Notably, these results were particularly significant for males, those with low education levels, and those over 60 years of age.

This thesis has implications for behavioural change, and hence, proactive adaptation and vulnerability reduction strategies. Indeed, underestimations of personal risk and high levels of self-efficacy may in fact lead to large proportions of the population believing themselves to be exempt from future climate change risks, which is highly undesirable in a changing climate. This study concludes that a deeper understanding of public risk perceptions might help decision-makers to better inform the public of risk and policy-makers of the way the public perceive risk. Here, adaptation response strategies are able to be framed more appropriately in local contexts, and in a way that is deemed acceptable to the public.

## DECLARATION

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I, Christopher David Button, certify that this work contains no material which has been accepted for the award of any other degree or diploma in any university or tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text.

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## ABBREVIATIONS AND ACRONYMS

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ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
AHD	Australian Height Datum
ANZLIC	Australian New Zealand Land Information Council
AR4	Fourth Assessment Report
COAG	Council of Australian Governments
CRCSI	Cooperative Research Centre for Spatial Information
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DCC	Department of Climate Change (Federal)
DCCEE	Department of Climate Change and Energy Efficiency (Federal)
DEC	Department of Environment and Conservation (Western Australia)
DEH	Department for Environment and Heritage (South Australia)
DEM	Digital Elevation Model
EIA	Environmental Impact Assessment
ESP	Ecosystem Services Product
GCM	Global Circulation Models
ICZM	Integrated Coastal Zone Management
IOCI	Indian Ocean Climate Initiative
IPCC	Intergovernmental Panel on Climate Change
LAPP	Local Adaptation Pathways Program
LGA	Local Government Association
MLS	Mutual Liability Scheme
NCVA	National Coastal Vulnerability Assessment
NEDF	National Elevation Data Framework
NEXIS	National Exposure Information System
NRC	National Research Council
NRM	Natural Resource Management
NSTF	National Sea change Taskforce
NYNRM	Northern and Yorke Natural Resource Management Board
PAR	Participatory Action Research

PAR model	Pressure and Release model
PIRSA	Primary Industries and Resources South Australia
RAC	Resource Assessment Commission
SA	South Australia
SARF	Social Amplification of Risk Framework
TAFE	Training and Further Education
TAR	Third Assessment Report
TDM	Tailored Design Method
UK	United Kingdom
UNCED	United Nations Convention on Environment and Development
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
US	United States
WA	Western Australia