

**Alternative States: Comparing Climate Adaptation Governance for the Gold Coast
(Australia), Fort Lauderdale (USA) and Beihai (China)**

Dr Michael Howes¹, Dr Aysin Dedekorkut-Howes¹, Dr Jason Byrne¹,
Associate Professor Tim Chapin², Dr Zhu Pengfei³

¹ Griffith Climate Change Response Program, Urban Research Program,
Griffith School of Environment, Griffith University, Australia.

² Department of Urban and Regional Planning, Florida State University, USA.

³ School of Ecology and Planning, Beihai College of Beihang University, China.

Contact email: m.howes@griffith.edu.au

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ABSTRACT: *The state plays a central role in society by providing public goods to the community, regulating the economy, and mediating the interactions between society and the environment. This role is supported by some unique powers including the ability to make and enforce laws, plan the development of settlements, and provide essential infrastructure. These features make the state a key player in any attempt to adapt to the impacts of climate change but its structure and powers vary considerably from country to country. This raises the important question of what institutional arrangements might enable or constrain an adaptation response. We seek to address this question via a comparative analysis of three cities: the Gold Coast in Australia, Fort Lauderdale in the USA, and Beihai in China. All three are comparable rapidly urbanising, low lying, subtropical coastal cities with similar development patterns, built environments, climates, landforms, socio-demographic compositions and growth drivers (e.g. tourism and property development). They are also all highly vulnerable to the impacts of climate change. Notwithstanding these similarities, the architecture of their state institutions and the distribution of powers across different levels of government vary significantly. By comparing these case studies our research will generate some key insights into the institutional features that influence the ability of the state to respond to the effects of climate change.*

Keywords: *climate change adaptation, the state, governance, comparative case studies, subtropical cities*

Introduction

Adapting to the impacts of climate change raises some major questions about the role of the state in society. Nowhere is this more evident than in highly vulnerable low-lying subtropical cities. This paper provides the theoretical backdrop to our ongoing research into climate change adaptation via a comparative case study of the Gold Coast (Australia), Fort Lauderdale (USA) and Beihai (China). The first section briefly summarises three key debates about the appropriate power, size and purpose of the state. Section two then offers a background comparison of Australia, the USA and China that illustrates how these debates can lead to very different state institutional arrangements that affect our three case studies. In section three we consider why climate change adaptation raises question about the

appropriate role of the state. Finally, we conclude with a brief outline of the relevant policies and plans that have already been developed.

1) The state: three debates revisited

How should we be governed? This is a deceptively simple question but it entails a range of complex issues. Do we really need the state to govern us or can we govern ourselves? How should government leaders be selected? What powers and responsibilities should they be given? What state institutional structures should support them? How should these relate to citizens, their rights and their interests? The answers to these questions have been fiercely debated for thousands of years resulting in the rise and fall of a range of different states. While we cannot resolve these disputes in this paper, it is important to be aware of the broader historical debates that provide the context to our research. At the risk of oversimplifying the complexity of competing state theories, we identify three interrelated political debates that need to be briefly revisited. First, is the debate about how much power should be granted to the state and what limits should be placed on this power (this debate pits authoritarian schools of thought against supporters of democracy). Second, is the debate about how large or small the state should be (that pits socialism against anarchism and libertarianism). Third, is the debate about the purpose of the state (i.e. what range of issues it should address) and whether its core imperatives should be narrowly defined or more expansive (which has been taken up by a range of social movements).

Authoritarian schools of thought essentially argue that strong leadership is needed to impose order from above to prevent society collapsing into chaos and conflict. Citizens are seen as naturally antagonistic and lacking in the ability to govern themselves. Plato's *Republic* (380 BCE), Machiavelli's *Prince* (1532) and Hobbes' *Leviathan* (1651) are classic examples of this line of thinking. It is argued that leaders should be appointed from the elite classes of society (because it is assumed that they are more capable and better educated), governing institutions should be highly centralised and citizens should be compelled to obey the directives of their leaders. Such views were long used to justify the rule of monarchs and emperors. Administrative rationalism is a more modern manifestation of this theory where experts within the state are expected to identify problems, formulate solutions and impose responses for the common good (Paehlke & Torgerson 1990). Such an approach was influential in shaping the command-and-control regulation of pollution by governments in the 1970s (Dryzek 1990; Howes 2005).

In contrast, democratic theories have less pessimistic views of human nature and assume that citizens have the ability to exercise autonomy. Instead of needing an authoritarian government to direct them, citizens choose rationally to cooperate in creating a state that will improve their situation. They are granted considerable freedom to make their own decisions and are empowered to influence policies. To protect these freedoms, leaders are elected by the citizens, powers are divided between different state institutions, and citizens are allocated rights that provide a base-line which government actions are not supposed to cross. This approach is described in the classical liberalism of Locke's *Second Treatise on Government* (1689), Paine's *Rights of Man* (1791) and Wollstonecraft's *Vindication of the Rights of Woman* (1792). Such ideas manifest themselves in modern liberal democratic political systems starting with the *US Constitution and Bill of Rights* (1791). Internationally they are the foundation for the UN's *Universal Declaration of Human Rights* (1948) and were extended to cover the rights of future generations in sustainable development policies such as *Agenda 21* (1992) (Howes 2005; Howes 2011). Some thinkers have even suggested that other sentient species be granted rights and/or have citizens elected to represent their interests (Singer 1975; Eckersley 2004).

The second debate is about the appropriate size of the state. Socialism argues that the state is needed not just to create order but also to provide the goods and services needed by the citizens. It is assumed that this production cannot be left to the private sector because the profit motive will encourage firms to reduce production costs by underpaying workers, cutting corners on safety and working conditions, and externalising as many costs as possible. The most prominent example of these kinds of critiques can be found in Marx's *Capital* (1867) (although he saw state control of production as a phase that society would move through on the way to communism). Subsequent scholars attempted to tease out the details of this argument. Weber, for example, analysed the operation of the state bureaucracy (Gerth & Mills 1991). Miliband (1969) and Poulantzas (1978) debated the nature of state power and how it could be used. With regards to the environment, a school of eco-socialist scholars formed that drew comparisons between the exploitation of people and the exploitation of the environment by business (Pepper 1994). This thinking manifests itself to some extent in the establishment of state owned and run parks, particularly when they have involved buying back land from private owners. Other scholars went on to develop an eco-socialist variant of feminism, drawing comparisons between the exploitation of women and the exploitation of the environment (Mies & Shiva 1993; Merchant 1992; Salleh 1987).

Anarchists and libertarians, on the other hand, argue that we don't need a large state sector because individuals and communities can organise themselves. Anarchists trace their ideas back to Godwin (1793), Bakunin (1882) and Kropotkin (1886) and want to eliminate both the state and the market by having decisions made by autonomous local communities. Late twentieth century versions of this school of thought led to eco-anarchism that advocated local control of the environment (Bookchin 1982). Perhaps community-based natural resource management programs such as Landcare would be a reasonable approximation of this approach (although state funding is still involved). The libertarians, on the other hand, want to cut back the state but keep the market economy, arguing that it would produce the most efficient allocation of resources. Hayek (1944) is one of the most well known proponents of this view and a branch of free market environmentalists have emerged (and been critiqued by Eckersley 1995). This approach manifests itself in privately run conservation parks that provide a profit for their owners (DiLorenzo 1993).

The two political debates discussed so far are obviously not the complete picture but they do provide key points of reference for the broad array of other theories of the state and government. Aristotle's *The Politics* (350 BCE), for example, eschewed both Plato's authoritarian state and Athenian democracy, while promoting the idea of the good citizen. More recently, Giddens' *The Third Way* (1998) attempted to avoid the pitfalls of both state socialism and libertarianism by encouraging the state, business and the community to engage in productive partnerships for the achievement of common goals. With regards to the environment, Dryzek (1987) suggested that state institutions be restructured along ecologically rational lines to improve feedback, coordination, robustness, flexibility and resilience. Similar ideas have appeared in the school of strong ecological modernisation, while more modest variants are implicit within many of the sustainable development strategies around the world (Howes 2005; Howes, et. al. 2010).

These debates are important because of the unique powers and functions that have been granted to the state. It has the exclusive ability to represent the interests of all its citizens in international forums and only it can sign international treaties on their behalf. Only the state can legitimately protect its territory and citizens using military force, regulate trade with other states and control migration across its borders. It alone can legitimately raise taxes to fund public works, create laws to govern its citizens, and use coercive force to implement plans, legislation or regulations (Althaus, Bridgman & Davis 2007; Brown 1997). The allocation, expansion or contraction of these powers lead to the third debate about whether the purpose of the state should be narrowly or broadly defined. Dryzek, et. al. (2003) argue that the early

modern state had three core imperatives: to establish internal order, to compete internationally and to fund both these activities. They point out that the spread of capitalism added securing economic growth and the rise of the labour movement added providing welfare to these core imperatives. They suggest that we are now seeing a move to add striving for sustainability. Despite the ongoing process of globalisation breaking down national borders and the rise of powerful transnational companies, theorists like Janicke and Jacob (2004) argue that the state still plays a central role in achieving sustainability because its unique powers can be used to promote cleaner production and ecologically modernise the economy (Howes, et. al 2010). Other theorists suggest that the state should pursue environmental justice to ensure that the impacts of industrialisation (such as climate change) do not fall disproportionately on the shoulders of the poor who are the most vulnerable and least resilient (Dedekorkut 2011; Byrne, et. al. 2009).

Our research taps into these debates in several ways. First, it explores how much the state can and should do in adapting to the impacts of climate change. Second, it compares three sister cities with similar degrees of physical and social vulnerability but very different state institutions and powers. Third, it compares and evaluates the adaptation responses by each state using the principles of effectiveness, efficiency and equity that have been derived from ecological modernisation and environmental justice respectively. All these are obviously linked to the powers, size and purpose of the state.

2) Alternative states & comparative case studies

The state is a hierarchical set of institutions with varying powers and resources. Powers are usually distributed both horizontally and vertically by a Constitution (which for Australia, the USA and China is a single written document). Table 1 gives a brief comparison of the main architecture of the state and some key social and economic indicators for the countries where our case studies are located. Horizontally, functional powers are divided between the executive, the legislature, the judiciary, administering departments or authorities and enforcement agencies. Vertically, responsibilities are distributed down the different levels of government from the national to the local levels with intermediate levels that may include states, provinces or counties (depending on the country). With regards to the environment, for example, national governments enforce international agreements and implement national standards. Local governments are responsible for water supply, sewerage disposal and garbage collection. The intermediate levels of government then fill in the gaps with their own

Table 1: Three State Comparison

	Australia	USA	China
Form of government	Constitutional monarchy	Democratic republic	Communist state
Constitution	Written, with limited powers for the Commonwealth	Written, with broad powers for the federal government	Written, with broad powers for executive
Head of State	Monarch of Britain represented by a Governor General	President popularly elected by college system	Chairman appointed by National People's Congress
Head of Government and executive	Prime Minister and cabinet drawn from elected members of parliament	Elected President who selects cabinet from outside of Congress	Premier and State Council appointed by National People's Congress
Vertical separation of powers	Commonwealth; 6 states & 2 territories; 717 local governments	Federal; 50 states & 1 territory; 16,504 township-level local governments	National; 22 provinces, 5 autonomous regions & 4 municipalities; 41,636 township-level local governments
National legislature	Bicameral Parliament: 150 seat House of Representatives popularly elected on preferential system; 76 seat Senate popularly elected on proportional system	Bicameral Congress: 435 seat House of Representatives; 100 seat Senate; both popularly elected by first-past-the-post system	Unicameral National People's Congress: 2987 seats elected by municipal, regional, and provincial people's congresses, and People's Liberation Army
Courts	High Court of Australia, Federal Court, Federal Magistrates Court, Family Court, Industrial Relations Court, State & Territory Courts	Supreme Court, US Courts of Appeal, US District Courts, State & County Courts	Supreme People's Court, Local People's Courts, Special People's Courts
Significant political parties	Labor, Liberal, National & the Greens	Democrat & Republican	Chinese Communist Party
Total land area (million square kilometres)	7.7	9.2	9.6
Total arable land (%)	6.15	18.01	14.86
Coastline (km)	25,760	19,924	14,500
Total renewable water resources (cubic km)	398	3,069	2,830
Population	21.5 million	310 million	1,330 million
Age distribution (%):			
0-14 years	18.6	20.2	19.8
15-64 years	67.9	67.0	72.1
65+ years	13.5	12.8	8.1
GDP (US\$ purchasing power parity (PPP))	\$889.6 billion	\$14,720 billion	\$9,872 billion
GDP per capita (US\$ PPP)	\$41,300	\$47,400	\$7,400
Population below poverty line (%)	N/A	12	2.8
GDP by sector (%):			
Agriculture	4.0	1.2	39.5
Industry	24.8	22.2	27.2
Services	71.2	76.7	43.6

Sources: CIA 2010; ALGA 2007; NLC 2002; UNESCAP

environmental laws, regulations, plans and conservation zones (Howes 2005; Doyle & McEachern 2000; Toyne 1994).

At the top of the state hierarchy is an executive that has the highest level of authority to make major policy decisions for the country and its citizens. In Australia the national executive is a cabinet of Ministers with specific portfolios of responsibility (e.g. the Minister for Climate Change) led by a Prime Minister. All are elected members of the Commonwealth parliament and lead the party that commands a majority in the House of Representatives. In the US, the President is elected separately from Congress and appoints their cabinet from outside the legislature. In China the Head of Government is the Premier who, together with their State Council, is appointed by the National People's Congress. Both Australia and China also have a separate Head of State. For Australia it is the Monarch of Britain who is represented by a Governor General appointed on the recommendation of the Prime Minister. For China it is the Chairman who is appointed by the National People's Congress. The US President is both head of government and head of state (CIA 2010; Hague Harrop & Breslin 1998).

The legislature is the only body that has the power to create laws and its members are usually elected (although often in very different ways). In Australia the legislature consists of a bicameral parliament: the House of Representative with 150 members elected to represent a particular constituency; and, a Senate of 76 members with 12 senators elected for each state and two for each territory. The USA also has a bicameral Congress with a 435 member House of Representatives and a 100 seat Senate, with two senators elected from each state. China has a unicameral National People's Congress consisting of 2987 seats, with members elected by the municipal, regional and provincial congresses as well as the People's Liberation Army (CIA 2010).

The structures of the legal system in all three countries reflect the various levels of government. The Australian High Court and the US Supreme Court have the role of interpreting and defending the constitution. Other federal, local and intermediate courts rule on their corresponding level of legislation (CIA 2010: Hague Harrop & Breslin 1998).

The bureaucracy of administrative departments and agencies also reflect the differing levels of government. In addition, their size and powers reflect differing political philosophies. The US system was built on a foundation of liberalism with a significant libertarian influence that encouraged a small state relative to the size of its market economy. China, on the other hand started with a state socialist approach after the 1949 revolution but since the 1970s has moved to a market-based economy. The state, however, has retained tight

controls and has been more active in steering development. Australia, by contrast, has steered a middle course between these two with a significant welfare state funded by a strong market economy (CIA 2010; Hague Harrop & Breslin 1998).

A range of political parties interact with the formal state institutions. In Australia the major parties are the centre-left Australian Labor Party and the centre-right Coalition of the Liberal and National parties. Minor parties, such as the Greens and Independents, are also represented and after the 2010 election they held the balance of power supporting a minority Labor government. Overall the ability of the Greens to get elected to the Commonwealth parliament has kept environmental issues like climate change on the political agenda and forced some policy concessions from the major parties. In the US the major parties are the centre-left Democrats and the right-wing Republicans. Although minor parties exist, the electoral system makes it difficult for them to get into Congress. In China the Chinese Communist Party dominates (CIA 2010; Hague Harrop & Breslin 1998).

The horizontal separation of powers is complicated by the vertical separation of responsibilities in each of the three countries (See Table 2). Australia has three levels: the Commonwealth presides at the national level; six state and two territories operate at the second level (with our case study falling in the state of Queensland); and, at the local level are 717 local councils (with the Gold Coast being our subject). The USA has four levels: the federal government; 50 states (with our case study in Florida); Counties (with Broward County of interest to us), and the City of Fort Lauderdale as one of 16,504 township-level local governments. In China there are three main levels of government: national; 22 provinces, 5 autonomous regions & 4 municipalities; and, 41,636 township-level local governments. Our case study is the city of Beihai within the Guangxi autonomous region (CIA 2010; ALGA 2007; NLC 2002; UNESCAP; Hague Harrop & Breslin 1998).

In terms of territory and physical vulnerability, all three countries have comparably large land masses and significant amounts of coastline. Australia has the longest coast (as you would expect from an island continent), significantly smaller area of arable land and lower renewable freshwater resources (CIA 2010). This makes it more generally vulnerable to effects such as coastal inundation and extended drought. Our three case studies are in regions that have all been identified as highly vulnerable to the impacts of climate change (Parry, et. al. 2007). All are low-lying, subtropical coastal cities with significant amounts of waterfrontage (see Table 2).

Table 2: Three Case Studies

		Gold Coast	Fort Lauderdale	Beihai
Government	National	Commonwealth Government of Australia	Government of the United States of America	Government of the People's Republic of China
	State	Queensland	Florida	Guangxi autonomous region
	Regional	none	Broward County	none
	Local	Gold Coast City Council	City of Fort Lauderdale	Beihai Government
Geography	Land area	1,402 km ²	3,108 km ² (Broward county)	3,337 km ²
	Coastline	55 km	37 km	110 km
	Navigable waterways	270 km	264 km	-
Population	Total	515,157 (2009)	Broward county: 1,766,476 (2009)	1,587,900 (2009)
	Density	367 people/km ²	568 people/km ²	404 people/km ²
	<18 years	22%	20%	-
	18-64 years	62.6%	65.2%	-
65+ years	15.4%	14.8%	-	

Sources: GCCC 2010; CFL 2010; USCB; BGPIN 2010

In terms of their citizens and social resilience, each country varies significantly. Australia has the smallest population, while China has by far the largest and has a significantly lower proportion of people over 65. The Chinese economy is also much more reliant on agriculture and industry while the services dominate in the USA and Australia (although primary and secondary industries remain significant contributors to their economies and exports). Per capita GDP is lower in China but the total size of the economy is an order of magnitude higher than Australia and growing rapidly (CIA 2010). With regards to our case studies, while all three have comparable population densities, both Beihai and Fort Lauderdale have significantly larger overall populations. The Gold Coast and Fort Lauderdale have a significantly higher proportion of people over 65 than their national averages (see Table 2) which makes them more vulnerable to the negative health impacts of heatwaves (please note that we do not have the corresponding age distribution data for Beihai).

In sum, these three case studies hold out the opportunity of an interesting comparative analysis. All three are physically vulnerable to the impacts of climate change with varying potential for social resilience. All have significantly different set of state institutions and political philosophies that will affect their ability to rise to the challenge posed by climate change adaptation.

3) The challenge of adapting to climate change

By its very nature, climate change is the kind of issue that put the powers, size and purpose of the state to the test. Adapting to its impacts puts policymaking and planning process in particular under severe pressure. This makes it a useful test case for comparing the effectiveness, efficiency and equity of the responses of the very different states of our three case studies. To understand why the issue is such a challenge, we need to make a short digression into the science of climate change.

The Earth's atmosphere contains certain gasses (such as carbon dioxide and methane) that create a natural greenhouse effect that acts as a buffer against extremes of heat and cold by absorbing and re-radiating long wave radiation. Since the industrial revolution human activities such as the burning fossils fuels and clearing land have raised the concentrations of these gasses in the atmosphere and enhanced the greenhouse effect. Some of the consequences of this change include increasing average global temperatures, rising sea levels, shifting patterns of precipitation, the decline of ice and snow cover in some areas, and an increase in the frequency and intensity of extreme weather events (such as droughts, floods, heatwaves, blizzards and storms) (Garnaut 2011; CSIRO & Bureau of Meteorology 2010; Arndt, Baringer & Johnson 2010; Australian Academy of Science 2010; Solomon, et. al. 2007). Some of the worst hit areas are sub-tropical coastal cities that will continue to be particularly vulnerable to these impacts (Stern 2006; Parry, et. al. 2007; UNEP 2007; DCC 2009; Australian Academy of Science 2010). Adapting to these impacts poses a particular problem for planners and policymakers, for example, in deciding what built assets and infrastructure to protect, or how best to assist the least resilient residents (e.g. the elderly, sick and poor).

Rittel and Webber (1973) identified 'wicked problems' for planners and policy makers that have ten key features, all of which apply to climate change adaptation (Head 2009; Head 2008). First, the issue is difficult to define: tens of thousands of scientists around the world have been studying the problem for several decades but it has not been possible so far to accurately predict the impacts on a specific city let alone a particular property. Second, there is no clear end or boundary to the problem: the impacts of climate change will continue for centuries and across all international boundaries. Third, there are no agreed criteria to judge the correctness of a response, hence debates over how much councils should restrict new developments in vulnerable zones. Fourth, responses have unforeseen consequences, for example, an attempt by the Australian government to promote energy efficiency and buffer the effects of higher temperatures by offering free insulation to homeowners led to poor

installation practices, the electrocution of several people, and many house fires. Fifth, responses that go wrong cannot easily be undone, such as the inappropriate relocation of essential infrastructure. Sixth, it is not possible to identify all possible options - new construction technologies and shifting settlement patterns may make current actions redundant. Seventh, there is no suitable guide or precedent to guide decision makers, in this case planners and policymakers have never had to deal with a global issue of this kind with such varying local impacts. Eighth, climate change is interconnected with other problems such as freshwater scarcity, food security, public health, emergency planning, coastal erosion, the loss of biodiversity, etc. Ninth, there is no agreed explanation of the problem across public opinion with sceptics either denying that climate change is happening or arguing that it has not been caused by human activities. Finally, mistakes in either action or inaction are very costly (Garnaut 2008; Stern 2005).

The wicked nature of climate change adaptation as a planning and policy issue is only part of the problem. The other part emerges from the fact that no state has been designed with the complex problem of climate change adaptation in mind (Howes & Dedekorkut-Howes 2011). The horizontal and vertical division of powers is already inhibiting action. In the USA, for example, the President and his executive are faced with a legislature that is hostile to action on climate change. In Australia, there is considerable uncertainty about how much should be done by the local, state and national governments, which risks the issue being caught between the bollards. In China, the central party can issue an executive decree, but local officials may be reluctant or slow to implement it due to vested interests or unwieldy bureaucracies. These kinds of issues inhibit the ability to create and implement a well coordinated response.

4) Current policies and plans

So we are faced with the wicked nature of climate adaptation as a problem, the varying and complex arrangements of state institutions in different countries, and fundamental debates over the appropriate power, size and purpose of the state. It is little wonder that the policy and planning response has been somewhat patchy and our three case studies offer a case in point (see Table 3).

The Gold Coast clearly has the most developed array of responses to date of the three cities, although most have been created or amended since 2007 and remain in the early stages of implementation. In general they advocate further research, better public engagement, and cooperation with business as a starting point but deal with the division of responsibility in different ways. The *National Climate Change Adaptation Framework* (COAG 2007) sought

Table 3: Pertinent Climate Change Responses

	Gold Coast	Fort Lauderdale	Beihai
National	<ul style="list-style-type: none"> • <i>National Climate Change Adaptation Framework</i>. April 2007. Council of Australian Governments. • <i>Adapting to Climate Change in Australia: An Australian Government Position Paper</i>. 2010. Department of Climate Change. • <i>National Climate Change Adaptation Research Plan: Settlements and Infrastructure</i>. December 2009. National Climate Change Adaptation Research Facility 		<ul style="list-style-type: none"> • <i>China's National Climate Change Programme</i>. June 2007. National Development and Reform Commission, People's Republic of China • <i>China's Scientific & Technological Actions on Climate Change</i>. June 2007. Ministry of Science and Technology, National Development and Reform Commission, Ministry of Foreign Affairs, Ministry of Education, Ministry of Finance ,Ministry of Water Resources ,Ministry of Agriculture ,State Environmental Protection Administration ,State Forestry Administration, Chinese Academy of Sciences, China Meteorology Administration, National Natural Science Foundation, State Oceanic Administration, China Association for Science and Technology
State	<ul style="list-style-type: none"> • <i>Toward Q2: Tomorrow's Queensland</i>. 2008. Department of the Premier and Cabinet. • <i>ClimateQ: Toward a Greener Queensland</i>. 2009. Department of Environment and Resource Management. • <i>Draft Queensland Coastal Plan</i>. 2009. Department of Environment and Resource Management. 	<ul style="list-style-type: none"> • <i>Florida's Energy & Climate Change Action Plan</i>. 2008. Governor's Action Team on Energy and Climate Change 	<ul style="list-style-type: none"> • <i>Climate Change Programs of Guangxi Zhuang Autonomous Region</i>. 2009. Government of Guangxi Zhuang Autonomous Region
Regional	<ul style="list-style-type: none"> • <i>South East Queensland Regional Plan 2009-2031</i>. 2009. Department of Infrastructure and Planning. • <i>South East Queensland Infrastructure Plan and Program 2010-2031</i>. July 2010. Department of Infrastructure and Planning. • <i>Draft SEQ Climate Change Management Plan</i>. 2009. Queensland Department of Infrastructure and Planning. • <i>South East Queensland Natural Resource Management Plan 2009-2031</i>. 2009. Department of Environment and Resource Management. • <i>Rural Futures Strategy for South East Queensland</i>. 2009. Department of Infrastructure and Planning. • <i>Draft Connecting SEQ 2031: An Integrated Regional Transport Plan for South East Queensland</i>. 2010. Department of Transport and Main Roads. • <i>South East Queensland Water Strategy</i>. 2010. Queensland Water Commission. • <i>The South East Queensland Healthy Waterways Strategy 2007-2012</i>. SEQ Healthy Waterways Partnership. 	<ul style="list-style-type: none"> • <i>The Strategic Regional Policy Plan for South Florida</i>. 2004. <i>South Florida Regional Planning Council</i>. • <i>Southeast Florida Regional Climate Change Action Plan</i>. In preparation. Southeast Florida Regional Climate Change Compact. 	
Local	<ul style="list-style-type: none"> • <i>Gold Coast Planning Scheme</i>. 2003 (amended January 2007). Gold Coast City Council. • <i>Gold Coast Climate Change Strategy 2009-2014</i>. 2009. Gold Coast City Council. 	<ul style="list-style-type: none"> • <i>Broward County Climate Change Action Plan</i>. 2010. Broward County Climate Change Task Force. • <i>The Fort Lauderdale Comprehensive Plan</i>. 2008. • <i>Fort Lauderdale Sustainability Action Plan</i>. In preparation. Carbon Solutions America 	<ul style="list-style-type: none"> • Permanent global monitoring station of climate change and human disturbance response since October 2008. • <i>Climate Change Action Day</i>. November, 2009

to improve cooperation between the different levels of government, particularly with regards to researching the problem and as a consequence the National Climate Change Adaptation Research Facility was created from a consortium of organisations and given a base at Griffith University. The Commonwealth's role as a capacity builder and reformer to provide national leadership is outlined in *Adapting to Climate Change in Australia: An Australian Government Position Paper* (DCC 2010) while much of the on the ground work is left to local and state governments. The Queensland government's main policy framework is *ClimateQ: Toward a Greener Queensland* (DERM 2009) that included adaptation elements for key industries and ecosystems. At the regional level, the *SEQ Draft Climate Change Management Plan* (CCMP) contains actions concerned with natural hazards and climate change adaptation to support the implementation of the *South East Queensland Regional Plan 2009-2031* (DIP 2009). Finally, at the local level, there is the Gold Coast City Council (2009) *Climate Change Strategy 2009-14* that aims to make infrastructure resilient and calls for coordinated actions between different levels of government.

The US does not have a single overarching climate change adaptation policy or framework and what initiatives there are tend to focus on mitigation. At the state level, the Governor's Action Team on Energy and Climate Change prepared the *Florida Energy and Climate Change Action Plan* of 2008. One of the six Technical Working Groups of the Action Team focused on adaptation and was responsible for developing "adaptation strategies to combat adverse impacts to society, public health, the economy, and natural communities in Florida" (Cruce, 2009). They developed a framework of 14 adaptation topics and broad objectives to address each. At the regional level, the South Florida Regional Planning Council (SFRPC), composed of Broward, Miami-Dade, and Monroe counties, finished an update of their state required *Strategic Regional Policy Plan* (SRPP) in 2004 (SFRPC, 2004). The SRPP is intended to provide guidance to all local government comprehensive plans within the region, in an effort to promote a coordinated, collaborative response to regional issues of importance. However, while climate change is now identified as an important regional issue, the SRPP falls short of explicitly proposing adaptive responses to deal with it. In addition to the SRPP, in 2009 the South Florida counties of Broward, Monroe, Palm Beach and Miami-Dade signed the *Southeast Florida Regional Climate Change Compact* to develop joint policy positions and legislative policy statements, as well as a *Southeast Florida Regional Climate Change Action Plan* that will include adaptation strategies (Miami-Dade County 2009). Despite its shortcomings, South Florida is generally ahead of many other areas in Florida (and the United States) in terms of engaging the issue of climate change. At the local level *Broward*

County Climate Change Action Plan was prepared by the Broward County Climate Change Task Force in May 2010 and provides recommendations to the Broward County Board of County Commissioners on mitigation and adaptation actions. In September 2009 the city of Fort Lauderdale commissioned a comprehensive analysis of the carbon footprint for the city and a *Sustainability Action Plan* aimed to reduce the footprint and is likely to be limited to mitigation actions (Brinkmann, 2009).

Beihai's response to climate change can only be characterised as nascent. The City is developing a climate response plan in accordance with China's *National Climate Change Programme* (2007). Two difficulties have thus far frustrated early attempts to prepare a coherent response. First, climate change impacts a range of Chinese State Ministries, including finance, water, education, agriculture, forestry, meteorology and science and technology among others. These ministries are fiefdoms of a sort and cross-ministerial collaboration can be time-consuming and awkward. Second, compounding these problems is a lack of enthusiasm for implementing the necessary reforms – mostly due to perceived financial impacts. As one government official told us in an interview: “China still has to go through an environmental Kuznets curve before local officials will take climate change seriously. While development is proceeding apace, there is little incentive to make changes that may harm a city's financial standing.” Nonetheless, Beihai City has recently established a climate change monitoring station in 2008 through the Marine Meteorological Observatory and had its first *Climate Change Action Day* in November 2009. Attempts are being made to trial demonstration projects such as the conservation of coastal mangroves and the development of biofuel alternative fuels by the China Oil and Food Company and pilot-testing a wind turbine for its utility in supplying the city with ‘green’ energy. Although these may seem to be small steps, they do signify a turning point in official attitudes towards the problem of climate change.

Conclusions

The role of the state in society has been debated for thousands of years and major disagreements over the appropriate powers, size and purpose continue to this day. These debates have a particular relevance to climate change adaptation because of the urgent need for action and the varying capacities of different types of state to respond. Our comparative case study of the Gold Coast, Fort Lauderdale and Beihai, offers the opportunity to explore these issues in more detail with such a wicked policy and planning problem pushing each set of state institutions to the limit. Our preliminary work has already uncovered a significant

difference in the number and type of policies and plans. There is obviously a great deal more work to do, but the indicators appear to suggest that this project could generate some extremely valuable knowledge.

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