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National
Climate Change Adaptation
Research Facility

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NCCARF's Adaptation Conversation:
the development of Policy Guidance Briefs

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Adaptation: responding to the effects of climate change

- Governments empowering communities, industry and business to act
  - Creating carrots and sometimes sticks to guide action
  - Generating the knowledge to underpin decisions and action
- Governments acting for the public good, e.g., coastal defences




Role of NCCARF

- **Mission:** To ensure Australia has the capacity to manage the risks and benefit from the opportunities of climate change, by:
  - generating and communicating knowledge needed by decision-makers to effectively respond to climate change;
  - building adaptive capacity.
- COAG initiative out of the *Climate Adaptation Framework*
- Funded in the current phase from 2008 to 30th June 2013 with $47 million from the Australian government and $14 million leveraged

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What we do: a numbers game

- 140 research projects
- Located in 33 universities + other organizations
- 8 Adaptation Research Networks with 5000 members
- 1 international conference with over 1000 attendees from 62 countries
- 2 national conferences with over 700 attendees
- Uncounted seminars, workshops and symposia

- In human health and well-being
  - Managing heat waves and stress
    - Aged care residences
    - Amongst refugee communities
  - Vector-borne diseases
    - Dengue fever
- Settlements and infrastructure
  - Managing coastal communities
  - Infrastructure vulnerabilities
- Social, institutional and economic dimensions
  - The role of insurance
  - The costs of adaptation, the costs of the impacts
  - Legislative and regulatory frameworks for adaptation

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The development of Policy Guidance Briefs

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The Adaptation Conversation

Local workshops, because adaptation is a local issue:

- Chosen to illustrate a particular adaptation challenge
- in every state and territory
- working to a common template to develop Policy Guidance Briefs
- practitioner based
- informed by NCCARF's research outputs
- generating policy guidance for the federal level

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Policy Guidance Briefs

- **Supporting decision-making for effective adaptation**
- **Ensuring Australia's urban water supplies under climate change**
- **Building resilient coastal communities and ecosystems**
- **Adapting agriculture to climate change**
- **Challenges of adaptation for local governments**
- Adaptation and Indigenous communities: lessons and challenges
- Climate-proofing Australia's infrastructure
- Heatwave planning
- Effective management of Australia's ecosystems under climate change
- Emergency management and climate change adaptation
- Policy, legislative and regulatory frameworks for adaptation
- Ensuring business and industry are ready for climate change

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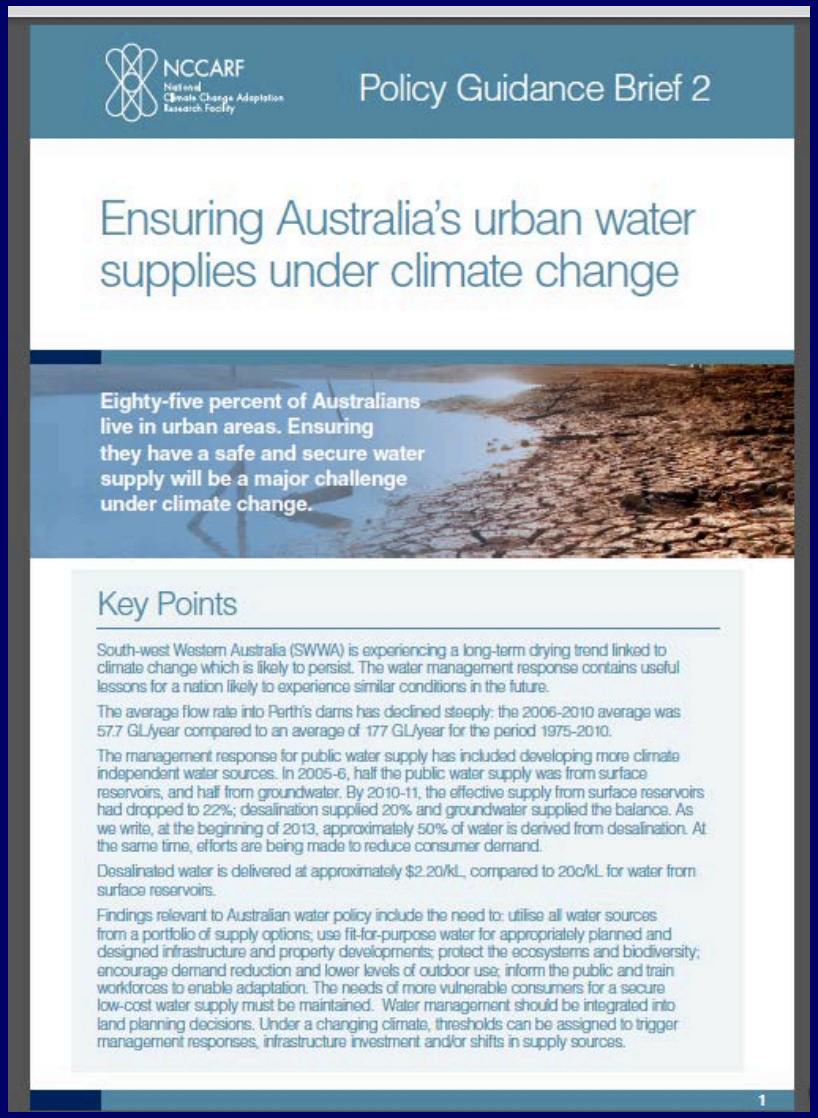
Urban water supplies under climate change

- Perth
- Recognition, underpinned by scientific research, of the reality of a changed and persistent rainfall regime
- All potential water sources need to be utilised to deliver a secure supply, including surface, ground (shallow and deep), recycled, piped and desalinated water



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Policy Guidance Brief 2

Ensuring Australia's urban water supplies under climate change

Eighty-five percent of Australians live in urban areas. Ensuring they have a safe and secure water supply will be a major challenge under climate change.

Key Points

South-west Western Australia (SWWA) is experiencing a long-term drying trend linked to climate change which is likely to persist. The water management response contains useful lessons for a nation likely to experience similar conditions in the future.

The average flow rate into Perth's dams has declined steeply: the 2006-2010 average was 57.7 GL/year compared to an average of 177 GL/year for the period 1975-2010.

The management response for public water supply has included developing more climate independent water sources. In 2005-6, half the public water supply was from surface reservoirs, and half from groundwater. By 2010-11, the effective supply from surface reservoirs had dropped to 22%; desalination supplied 20% and groundwater supplied the balance. As we write, at the beginning of 2013, approximately 50% of water is derived from desalination. At the same time, efforts are being made to reduce consumer demand.

Desalinated water is delivered at approximately $2.20/kL, compared to 20c/kL for water from surface reservoirs.

Findings relevant to Australian water policy include the need to: utilise all water sources from a portfolio of supply options; use fit-for-purpose water for appropriately planned and designed infrastructure and property developments; protect the ecosystems and biodiversity; encourage demand reduction and lower levels of outdoor use; inform the public and train workforces to enable adaptation. The needs of more vulnerable consumers for a secure low-cost water supply must be maintained. Water management should be integrated into land planning decisions. Under a changing climate, thresholds can be assigned to trigger management responses, infrastructure investment and/or shifts in supply sources.

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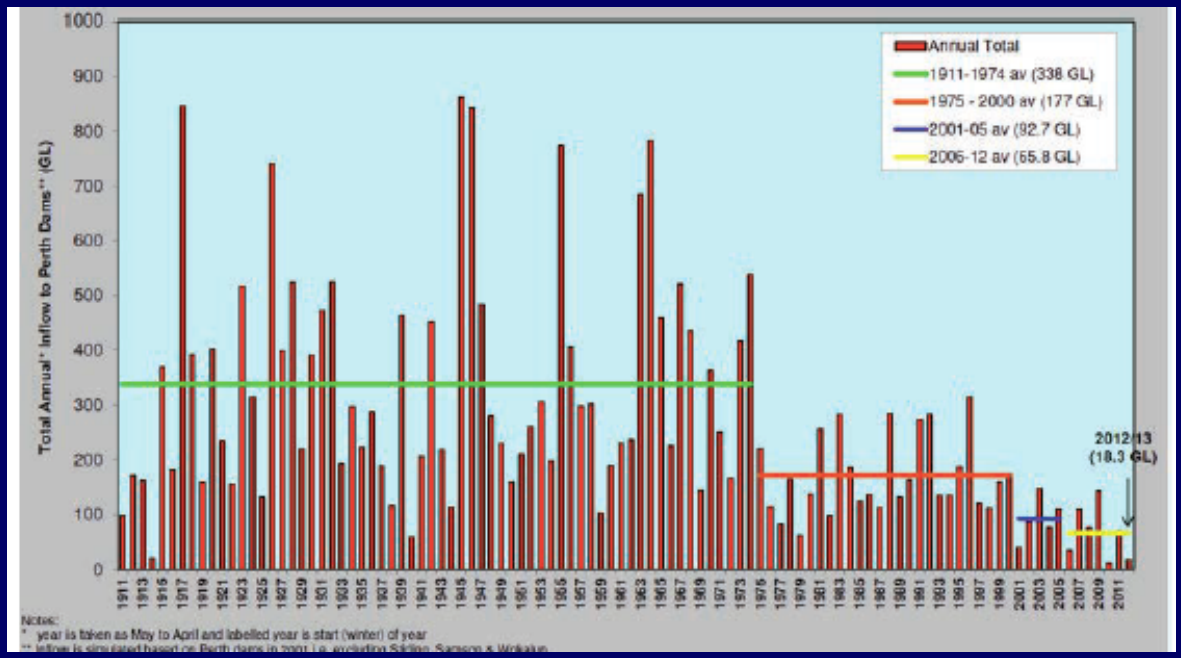
Urban water supplies under climate change

Recognition, underpinned by scientific research, of the reality of a changed and persistent rainfall regime

Around 50% of Perth's water now from desalinated sea water



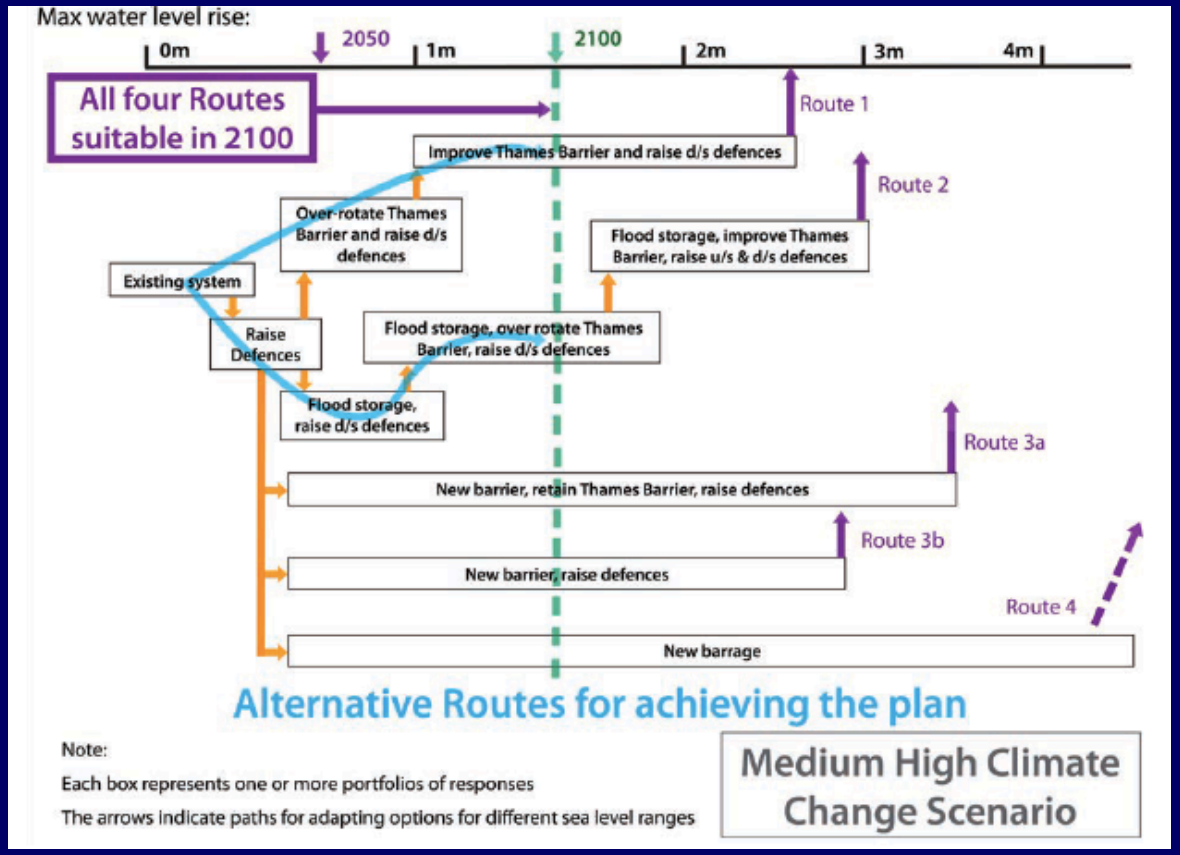
Supporting decision-making for climate change

- Climate change is a "wicked" problem because of the inherent and pervasive uncertainty
- Decision-making which is flexible, does not lock us into inappropriate and costly financial investments, is low-regrets and does not restrict future adaptation actions

Supporting decision-making for climate change

Taking uncertainty into account

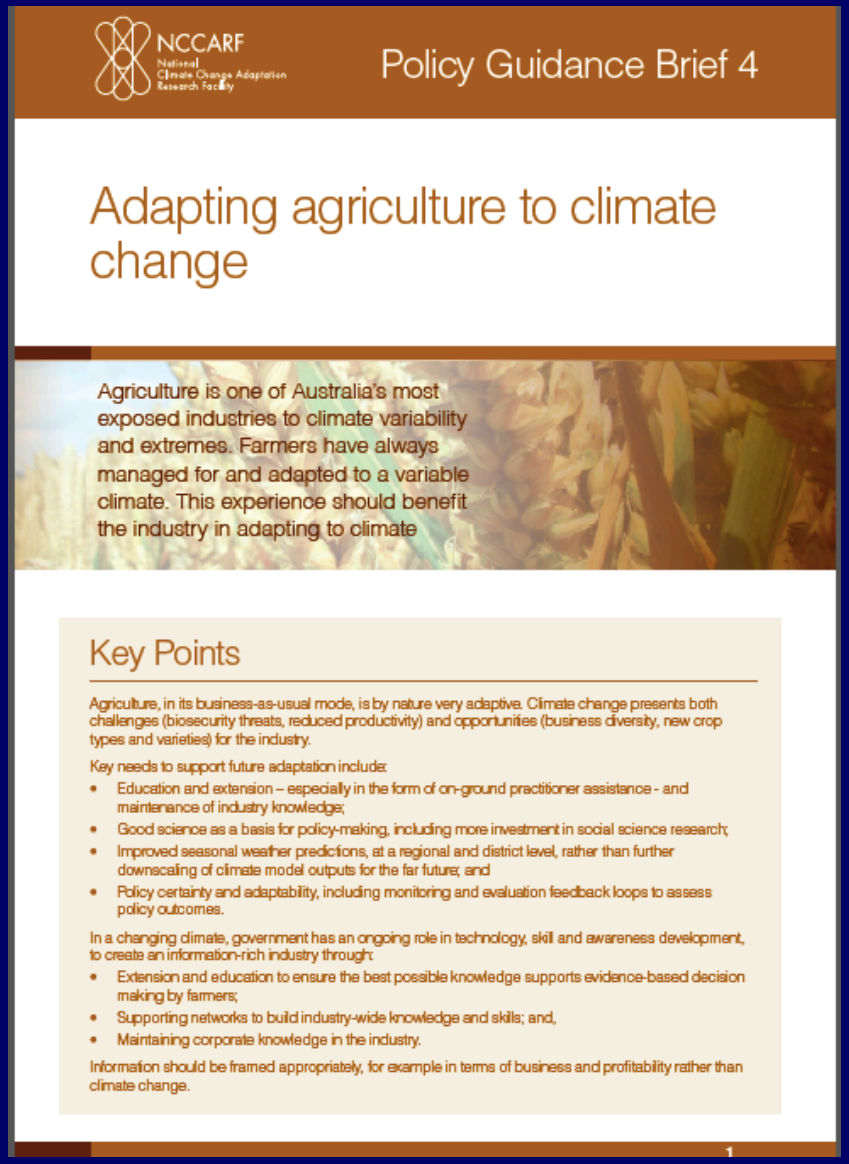
Flexible adaptation routes that can change depending on changing information, here, how actual sea-level rise evolves



Adapting agriculture to climate change

- Agriculture is very adaptive.
- Climate change presents additional challenges:
  - biosecurity threats, reduced productivity

  and opportunities:
  - business diversity, new crop types and varieties
- Adaptation is likely to focus on the near future rather than a century ahead, and to address climate variability and climate change seamlessly.



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Policy Guidance Brief 4

Adapting agriculture to climate change

Agriculture is one of Australia's most exposed industries to climate variability and extremes. Farmers have always managed for and adapted to a variable climate. This experience should benefit the industry in adapting to climate

Key Points

Agriculture, in its business-as-usual mode, is by nature very adaptive. Climate change presents both challenges (biosecurity threats, reduced productivity) and opportunities (business diversity, new crop types and varieties) for the industry.

Key needs to support future adaptation include:

- Education and extension – especially in the form of on-ground practitioner assistance - and maintenance of industry knowledge;
- Good science as a basis for policy-making, including more investment in social science research;
- Improved seasonal weather predictions, at a regional and district level, rather than further downscaling of climate model outputs for the far future; and
- Policy certainty and adaptability, including monitoring and evaluation feedback loops to assess policy outcomes.

In a changing climate, government has an ongoing role in technology, skill and awareness development, to create an information-rich industry through:

- Extension and education to ensure the best possible knowledge supports evidence-based decision making by farmers;
- Supporting networks to build industry-wide knowledge and skills; and,
- Maintaining corporate knowledge in the industry.

Information should be framed appropriately, for example in terms of business and profitability rather than climate change.

1

Adapting agriculture to climate change

- Greatest impact from drought: lower yields, reduces stock numbers, threatens long-term sustainability

- No-till practices have provided 30 years grace with respect to drying
- Policy-making for the long-term, distinguishing between incremental and transformational changes, identifying trigger points, ensuring policy instruments for effective and timely transition

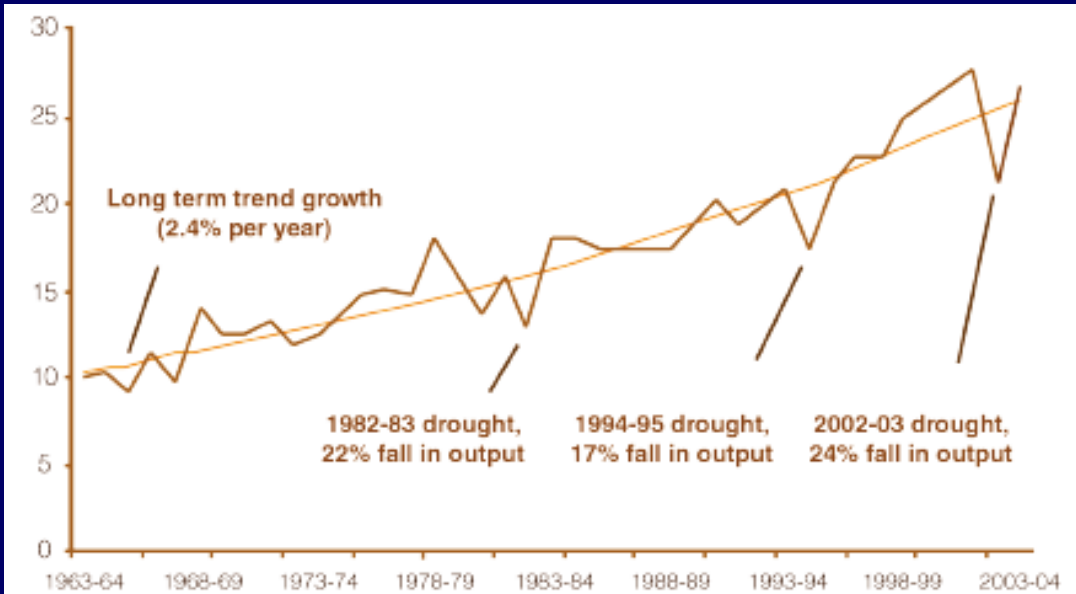

Figure 1: Growth in agriculture output, 1963-64 to 2003-04. Value added ($ billion, constant 2002-03 prices) (PC, 2005)

Building resilient coastal communities and ecosystems

- Consistent guidance from state and federal government on how coastal zones should be managed
- Legislative support linking land-use planning, conservation and hazard protection
- Authority to ensure compliance


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Policy Guidance Brief 1

Building resilient coastal communities and ecosystems

Around 85% of the nation's population live within 50 km of the coast. Today, these people are exposed to flood and cyclone damage. Under a changing climate, the potential for damage to homes, infrastructure and ecosystems will be made worse by sea-level rise and inundation, especially in areas where windstorms become more frequent and/or more severe. Adaptation to manage those challenges will be essential.

Key Points

Coastal managers face the challenges, on the one hand, of future climate change and sea-level rise and, on the other, of increased development demands, infrastructure planning, renewal and maintenance, and environmental protection. Effective management of the coastal zone by local governments under climate change and sea-level rise requires:

- consistent guidance from state and federal government on how coastal zones should be managed, with legislative support that links land-use planning, conservation and hazard protection. This includes clear guidance on the circumstances under which development should not be approved;
- systems that provide local governments with the authority to ensure compliance; and
- time and investment in knowledge, capacity and resources to transition local governments successfully to this new paradigm.

Such frameworks allow local governments to embed adaptation to climate change into their day-to-day operation and effectively manage the coastal zone under climate change.

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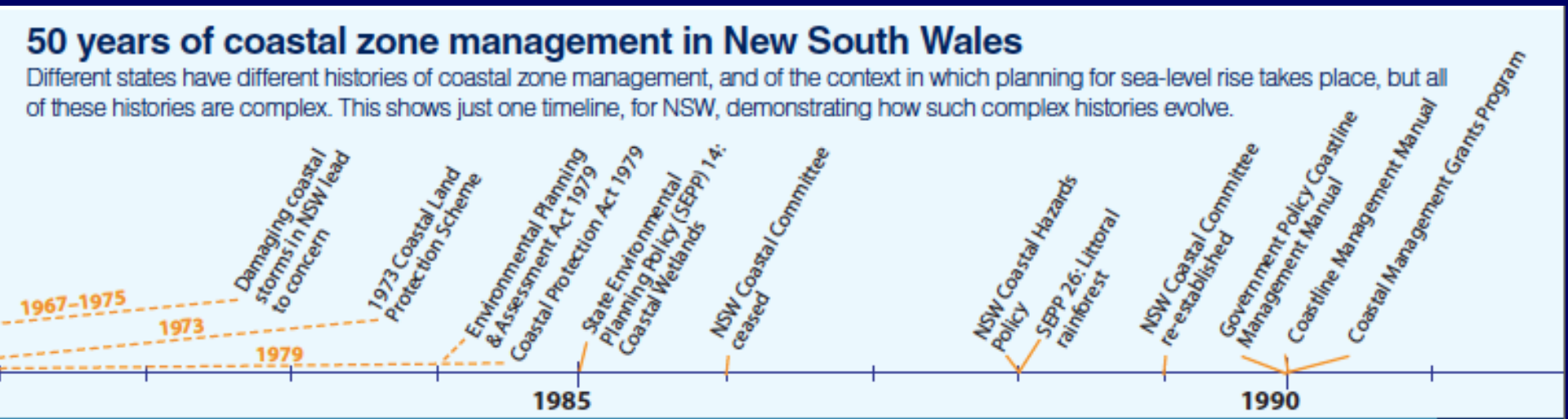

Challenges of adaptation for local governments

1. Clarity on roles and responsibilities across all levels of government.
2. A shared approach and long-term commitment to manage impacts
3. Clear understanding of legal liabilities for past and future decisions
4. Sustained, long-term financial support for adaptation planning.
5. Support adaptation mainstreaming in local governments.
6. Tools, frameworks and information to support adaptation decision-making.
7. Development and monitoring of organisational and community capacity to adapt.

Over-arching messages

- Climate change shifts the policy development context
- Adaptable and adaptive policy to enable appropriate and timely responses
- Consistency between jurisdictions and tiers of government and through time

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