



SUMMARY REPORT:

Burke Shire Council:
Coastal Hazard Adaptation Strategy (CHAS) Phase 5 - 8

Phase 8 summary report

July 2021

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1 Introduction

Burke Shire Council (GRC) is working in partnership with Alluvium Consulting Australia Pty Ltd (Alluvium) and project partners Natural Capital Economics (NCE) to develop Phases 3-8 (Table 1) of a Coastal Hazard Adaptation Strategy (CHAS). This work is being undertaken as part of the QCoast₂₁₀₀ program - <http://www.qcoast2100.com.au/>.

Table 1. Stage of CHAS

Phase	Description	Project status
1	Plan for life-of project stakeholder communication and engagement	Complete
2	Scope coastal hazard issues for the area of interest	Complete
3	Identify areas exposed to current and future coastal hazards	Complete
4	Identify key assets potentially impacted	Complete
5	Undertake a risk assessment of key assets in coastal hazard areas	Complete
6	Identify potential adaptation options	Complete
7	Socio-economic appraisal of adaptation options	Complete
8	Strategy development, implementation and review	Complete

This report provides a summary of the CHAS Phase 8 activities and outcomes. Key activities of Phase 8 have included:

- Relevant engagement and communication actions and materials
- Development of a Coastal Hazard Adaptation Strategy and supporting documentation
- Development of a 10-year Implementation Plan, including monitoring and evaluation and change management actions.

Key outcomes from Phase 8 include:

- A shared understanding of coastal hazards and adaptation options
- A shared understanding of preferred adaptation actions for the Burke Shire coast
- A shared understanding of priority actions for implementation over the next 5 – 10 years, with shared stakeholder roles and responsibilities.



Burke Shire salt pans

2 Burke Shire - Coastal Hazard Adaptation Strategy

2.1 Development of the Strategy

The development of the Burke Coastal Hazard Adaptation Strategy (CHAS, or ‘the Strategy’) for Burke Shire Council has included eight phases of work and associated reports (Table 2).

Table 2. Phased work and reports associated with the Coastal Hazard Adaptation Strategy development

Phase	Description	
1	Plan for life-of project stakeholder communication and engagement	Phase 1 summary report (BSC 2019a)
2	Scope coastal hazard issues for the area of interest	Phase 2 summary report (BSC 2019b)
3	Identify areas exposed to current and future coastal hazards	Phase 3 summary report (BSC 2020a)
4	Identify key assets potentially impacted	Phase 4 summary report (BSC 2020b)
5	Undertake a risk assessment of key assets in coastal hazard areas	Phase 5 summary report (BSC 2020c)
6	Identify potential adaptation options	Phase 6 summary report (BSC 2021a)
7	Socio-economic appraisal of adaptation options	Phase 7 summary report (BSC 2021b)
8	Strategy development, implementation and review	Phase 8 summary report (BSC 2021d) – this document
<i>Resilient Coast – Resilient Gulf</i> - Coastal Hazard Adaptation Strategy and supplements.		The Coastal Hazard Adaptation Strategy (BSC 2021c) - Forming part of Phase 8, providing an overview of findings of previous phases

The Coastal Hazard Adaptation Strategy (BSC 2021c) is the summary document that provides an overview of Phases 1 – 8, and defines the strategic actions identified to proactively manage the potential impacts of coastal hazards. The Plan includes a set of actions to be implemented over the next 5 – 10 years.

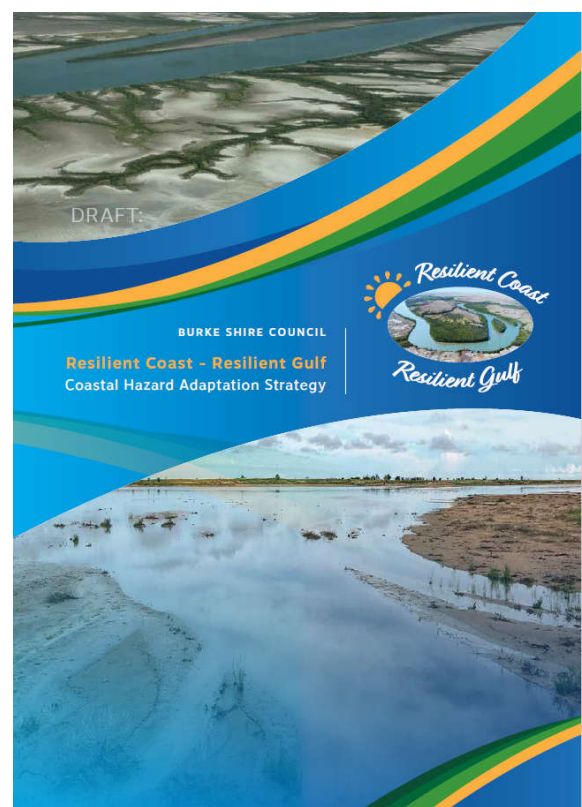
The majority of actions can be embedded into existing Council programs and activities, to be implemented as part of business as usual activities and over time will increase the resilience of the region to coastal hazards and reduce social, economic and environmental impacts. The actions span across four themes:

1. Initiatives to enhance adaptive capacity
2. Planning updates
3. Modifying infrastructure
4. Coastal management and engineering

Purpose of the Strategy

The purpose of the Coastal Hazard adaptation Strategy is to:

- Inform future decisions regarding the protection and management of our coast and foreshore
- Inform future land use planning
- Guide the management of public utilities and facilities
- Guide the management of areas of environmental and cultural significance
- Foster collaboration and the shared care of our coastline.



2.2 Strategy and supporting documentation

The Burke Shire Coastal Hazard Adaptation Strategy is a stand-alone document available on the Burke Shire Council website (<https://www.burke.qld.gov.au/coastal-hazard-adaptation-strategy>) along with a series of supplements to the Strategy.

The supplements to the Strategy (on the website) include:

- **Supplement A:** Fact sheets
 - Commonly used terms
 - Coastal landscapes, hazards and adaptation
 - Coastal adaptation options
 - Resilient housing
 - Coastal economics
- **Supplement B:** Coastal hazard maps
 - Erosion Prone Areas (present day, 2050 and 2100)
 - Storm tide inundation prone areas (present day, 2050 and 2100)
- **Supplement C:** Adaptation actions summary sheets
 - Actions to enhance adaptive capacity
 - Planning updates
 - Modifying infrastructure
 - Coastal management and engineering.

2.3 Implementation Plan (this document)

This Phase 8 summary report provides additional information associated with the development of the Coastal Hazard Adaptation Strategy, and to guide successful implementation of the Strategy. This Phase 8 summary report includes:

- A summary of the Phase 8 engagement activities and materials (Section 3 of this document)
- An Implementation Plan for the Coastal Hazard Adaptation Strategy (Section 4 of this document), including:
 - Approach to implementation
 - Implementation of actions (timeframe, mechanisms, lead agency, supporting parties, costs, funding sources)
 - Additional principles for implementation
 - Barriers and change management
 - Monitoring, evaluation and review.

This Phase 8 summary report should be read in conjunction with the Coastal Hazard Adaptation Strategy document (BSC 2021c).

3 Phase 8 engagement

3.1 Resilient Coast – Resilient Gulf

The Coastal Hazard Adaptation Strategy has been developed through the program ‘Resilient Coast – Resilient Gulf’. The Strategy development has been informed through consultation with key stakeholders and the community.

Key engagement events have included:

- Ongoing consultation with Burke Shire Council
- Presentations to Council and the community in person at Burketown’s Council chambers in August 2020 and April 2021.
- Online presentation of Phase reports throughout the duration of the project (February 2020-July 2021)
- Public comment period over 4 weeks in June-July 2021.

3.2 Communication materials

The range of communications materials produced during Phase 8 include:

- Project updates
- Fact sheets
- Council’s media releases
- Coastal Hazard Adaptation Strategy summary.

A copy of all communications materials are provided in Attachment A, as well as on the Council website located at: <https://www.burke.qld.gov.au/coastal-hazard-adaptation-strategy>.

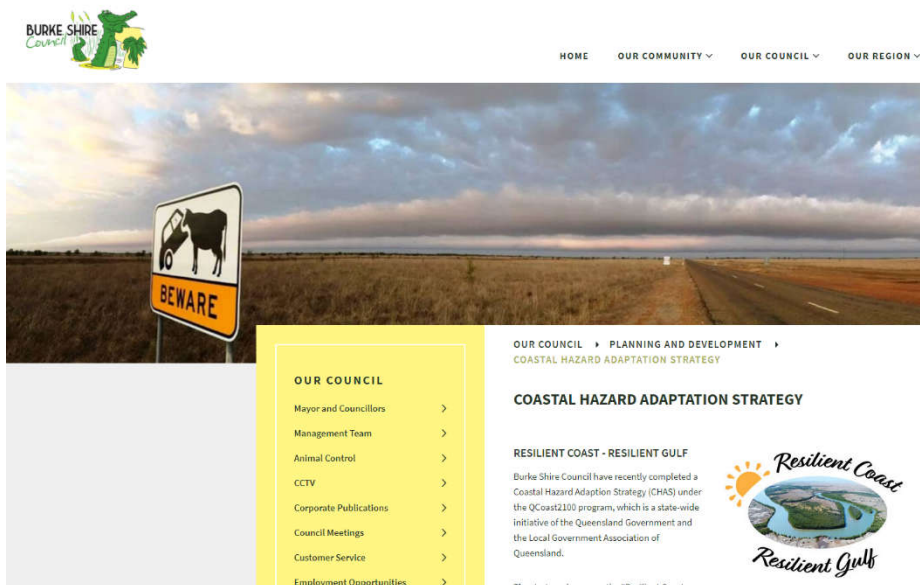


Figure 1. Resilient Coast – Resilient Gulf webpage

3.3 Public comment period

The draft Coastal Hazard Adaptation Strategy was released for public comment from 24 of June to 22 of July 2021 on Council's website and promoted by the Council communication team. No response was received from the community.

The project webpage received 87 visits during the consultation period. No submissions were received from the community. Given there were no submissions from 87 visits it can be deemed that the majority of the visits were not strongly opposed to the strategy or either generally supportive.

4 Phase 8 – Implementation Plan

4.1 Implementation Plan purpose

The purpose of this Implementation Plan is to provide additional detail to guide successful implementation of the Coastal Hazard Adaptation Strategy priority actions over the next 5 – 10 years. The Implementation Plan includes:

- The approach to implementation of actions
- Implementation timeframes, mechanisms and processes for delivery, lead agency and supporting parties, indicative costs and potential funding sources.

The Implementation Plan should be read together with the Coastal Hazard Adaptation Strategy (BSC 2021c) and the Supplements (A – C).

4.2 Approach to implementation

Burke Shire Council will implement the Coastal Hazard Adaptation Strategy through an adaptive management framework (as per Table 3 and Figure 2) with a focus on embedding outcomes and actions from the Strategy into existing Council process and activities, as well as implementing new initiatives.

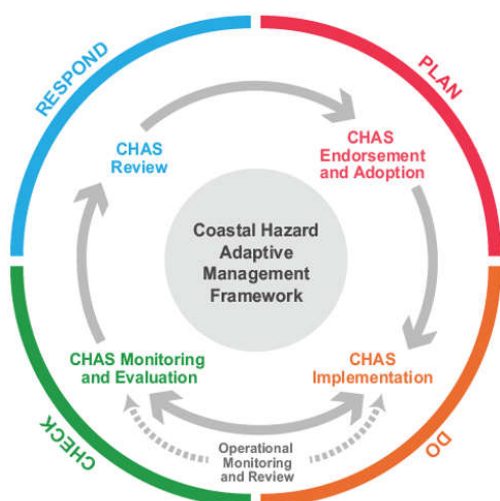


Figure 2. Coastal hazard adaptive management framework for continuous improvement (LGAQ and DEHP 2016)

Table 3. Adaptive management framework approach

Stage		Description / guidance (LGAQ and DEHP 2016)	Coastal Hazard Adaptation Strategy implementation
PLAN	Endorsement and adoption	Endorsement and adoption by Council and stakeholders	TBC
DO	Implementation	Implementation of actions addressing existing / future risks / governance arrangements through: <ul style="list-style-type: none"> - Corporate plan + Operational plan - Corporate reporting - Risk management framework - Long term financial plan - Annual budgets + Asset management - Planning scheme 	Implementation of actions is focused through embedding in existing Council processes and activities, in particular through the: <ul style="list-style-type: none"> - Corporate Plan and other strategic plans - Asset management - Statutory planning and Planning Scheme updates

Stage		Description / guidance (LGAQ and DEHP 2016)	Coastal Hazard Adaptation Strategy implementation
		<ul style="list-style-type: none"> - Disaster management plan - Community engagement policy - Capacity building - Roles and responsibilities. 	<ul style="list-style-type: none"> - Disaster management - Budget and finance. <p>In addition, new initiatives include monitoring and capacity building.</p>
	Operational monitoring and review	<p>Ongoing operational review and monitoring of risks and thresholds / impacts</p> <p>Monitoring and adjustment of 'on-ground' risk treatment actions.</p>	<p>Elements of operational review incorporated into Strategy monitoring, evaluation and review (MER) process (Section 4.7 of this document).</p>
CHECK	Monitoring and Evaluation (MER)	<p>Regular and systematic monitoring and evaluation of implementation and community, scientific and legislative context including:</p> <ul style="list-style-type: none"> - Extent of change in thresholds and impacts / change risk profile - New science and data and adaptation approaches - Emerging best-practice and learnings - Community attitudes / aspirations - Implementation progress - Governance effectiveness - Legislation. 	<p>Key elements of the Coastal Hazard Adaptation Strategy MER process (Section 4.7 of this document) including:</p> <ul style="list-style-type: none"> - 10 year review of the Plan, and at least 2 years prior to the Planning Scheme update (a 10 year review schedule). - Implementation monitoring - Community perceptions - Triggers to review / update the Plan linked to changes in policy environment, scientific advances, governance and legislation changes.
RESPOND	Review	<p>Monitoring and evaluation will inform when a review is required, and the scope and process of the review.</p>	<p>Review occurs every 10 years or when triggered by MER process. First review in 2031 to inform future Planning Scheme updates.</p>

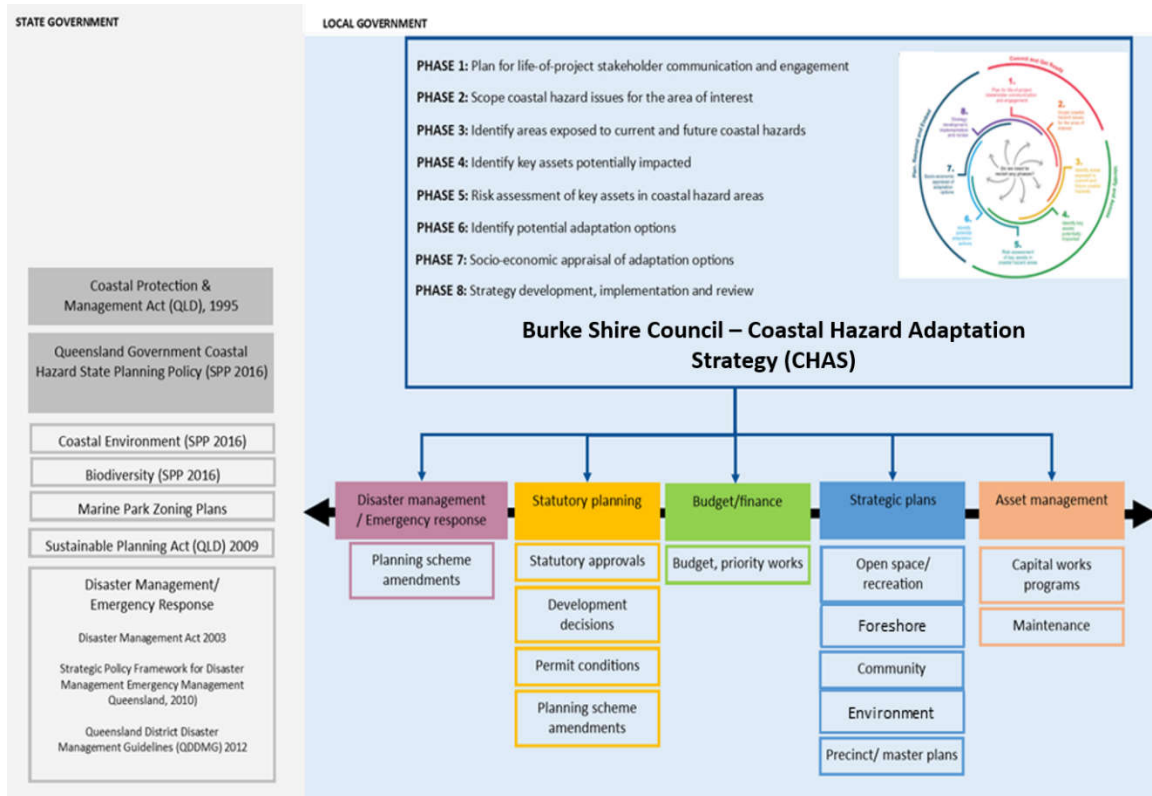


Figure 3. Coastal Hazard Adaptation Strategy implementation pathways through existing Council processes and activities

4.3 Implementation of adaptation actions

Relevant information for the implementation of adaptation actions in the ten-year Coastal Hazard Adaptation Strategy is documented in Table 4 to Table 7. This includes estimated timeframes, mechanisms, lead agency and supporting parties, budget requirements and potential funding sources.

Table 4. Region-wide initiatives to build capacity – Implementation of actions (dependent on funding opportunities)

Theme	Adaptation action no.	Description	Priority adaptation actions	Estimated timeframe/priority	How to be implemented / mechanism	Lead agency	Supporting parties	Estimated budget requirements	Funding sources	
1. Region-wide initiatives to build capacity	1.1 Community stewardship program	Develop programs and partnerships to enhance stewardship of the coast and riverbanks	1.1.1	Assign coastal management work program to relevant council area/staff	By June 2022	Defined role/initiative to oversee the progression of Strategy implementation, lead delivery of all actions, and lead new initiatives in the Plan (including community stewardship program).	Council	-	\$15k – 25k p.a. (or this could be combined with an existing position within Council)	Council budget, grants
			1.1.2	Seek co-funding / resources for further initiatives through grants and stakeholder partnerships for CHAS related initiatives, including LandCare grants, Queensland Reconstruction Authority grants (QRRRF) and other state and federal grants	Annually	Identify relevant grant applications Identify stakeholder funding partnerships	Council	Agency stakeholders Community groups	-	-
			1.1.3	Establish collaborative partnership in coastal hazard management with Carpentaria Land Council Aboriginal Corporation (CLCAC), Southern Gulf NRM and Northern Gulf NRM	By June 2022	Establish agencies Working Group on coastal adaptation, meeting periodically, led by council staff as per action 1.1.1	Council	Carpentaria LCAC, Southern Gulf NRM, Northern Gulf NRM	--	--
			1.1.4	Promote coastal hazard education in schools in collaboration with external partners and providers (e.g. CLCAC and others)	By June 2022	Establish Working Group and meeting with CLCAC	Council	Carpentaria LCAC	\$10k	Council budget, grants
	1.2 Knowledge sharing	Facilitate knowledge sharing and education on hazards and adaptation. Knowledge sharing includes collaborative partnerships.	1.2.1	1.2.1 Identify networks / forums for knowledge sharing (internal and external), including opportunities to share information with Carpentaria Shire Council	Annually	Identify existing forums, host new meetings/forums	Council	Agency stakeholders	-	-
			1.2.2	Facilitate training for staff in coastal resilience management	Annually	Targeted training/workshops	Council	Agency stakeholders Community groups Universities	\$4k p.a.	Community grants State Government
			1.2.3	Promote cross-sector partnerships and initiatives to enhance resilience and strategic adaptation for tourism	Annually	Targeted meetings and projects to form and nurture partnerships, and seek joint projects and funding opportunities	Council	Agency stakeholders State Government Universities	-	-
			1.2.4	Support research collaborations with universities and research organisations through partnerships (e.g. Australian Research Council ARC Linkage, National Environmental Science Program NESP funding)	Annually	Identify research opportunities in collaboration with universities or research organisations operating in the region	Council (Eng Dept)	Agency stakeholders State Government Universities	\$75K p.a.	ARC, NESP, Council contribution
			1.2.5	Support research in catchment management and its impact on coastal vulnerability (e.g. impact of water quality on vegetation; land loss and erosion in the catchment related to land use)	Annually	Identify research opportunities in collaboration with universities or research organisations operating in the region	Council (Eng Dept)	Agency stakeholders State Government Universities	\$50K p.a.	ARC, NESP, Council contribution
	1.3 Monitoring	Monitor changes in coastal hazard risk and effectiveness of adaptation.	1.3.1	Establish partnership with CLCAC to monitor shorelines and the impact of erosion and inundation	By Dec 2022	Establish specific program, including data collection and storage mechanisms	Council (Eng Dept)	Carpentaria LCAC	\$25k set up \$5k p.a. operational	Community grants State Government Council budget
			1.3.2	Establish partnership with CLCAC to support monitoring the risk of saltwater intrusion into pastoral land and water bodies	By 2031 (or earlier if required)	Establish specific program, including data collection and storage mechanisms	Council (Eng Dept)	Carpentaria LCAC	\$10k set up \$5k p.a. operational	Community grants State Government Council budget Private funding
			1.3.3	Establish a foreshore and riverbank condition monitoring system in collaboration with CLCAC rangers	By Dec 2022	Design monitoring system using a combination of photos and data collection	Council (Eng Dept)	Carpentaria LCAC	\$5k set up \$2k p.a. operational	Council budget, grants
			1.3.4	Expand and support the CLCAC shoreline monitoring program with georeferenced photo points to monitor erosion and land loss to sea inundation	By 2025	Existing program 1.3.3 to be expanded	CLCAC	Council	\$5k set up \$2k p.a. operational	Council budget, grants
			1.3.5	Expand and support the CLCAC marine pollution reduction program to maintain healthy marine vegetation to reduce erosion impacts	By Dec 2022	Existing program to be expanded	CLCAC	Council	\$10k p.a. operational	Council budget, Grants

Theme	Adaptation action no.	Description	Priority adaptation actions	Estimated timeframe/priority	How to be implemented / mechanism	Lead agency	Supporting parties	Estimated budget requirements	Funding sources	
	1.4 Research	Strengthen research collaborations with universities and research organisations in exploring coastal hazards and future adaptation	1.4.1	Establish collaboration with key universities and research centres to progress suitable actions in the Strategy	Annually	Existing program to be expanded	Council (Eng Dept)	Universities	\$15k p.a.	Council budget Research grants
			1.4.2	Apply for collaborative government funding grants for relevant actions	Annually	Apply for grants link to action 1.2.4	Council (Eng Dept)	Universities, State agencies	--	Various

Table 5. Planning updates – Implementation of actions

Theme	Adaptation action no.	Description	Priority adaptation actions	Estimated timeframe/priority	How to be implemented / mechanism	Lead agency	Supporting parties	Estimated budget requirements	Funding sources	
2. Planning updates	2.1 Land use planning	Use the outcomes of the Strategy to inform statutory planning and other strategic plans.	2.1.1	All planning matters undertaken by Council to incorporate and have regard to the new coastal hazard information presented in the Coastal Hazard Adaptation Strategy	Ongoing	Through Corporate Plan, Operational Plan, Statutory Planning, development approvals, Planning Scheme.	Council (CEO)	-	-	-
			2.1.2	Consider implications (within Council) of the Strategy for future development approvals and conditions including: <ul style="list-style-type: none"> - approval conditions for lots of un-developed land with existing approvals - implications for future development approvals and conditions. 	Ongoing	Through Council's statutory planning and development approvals team.	Council (CEO)	-	-	-
			2.1.3	For the next scheduled Planning Scheme update, use the updated Erosion Prone Area and storm tide inundation extent and outcomes of the Strategy to inform decisions on development areas and strategic land use planning.	2023	Through Planning Scheme review processes.	Council (CEO)	-	-	-
	2.2 Disaster management	Update emergency response planning	2.2.1	Use the updated Erosion Prone Area and storm tide mapping, assets exposure and risk assessment to update the Burke Shire Local Disaster Management Plan.	Ongoing	Through Council Disaster Management co-ordinator and processes.	Council (CEO)	LDMG stakeholder partners	-	-
	2.3 Early warning systems	Early warning systems for erosion and storm tide inundation.	2.3.1	Investigate potential use of early warning system service using up-to-date technologies (e.g. EWN/Weatherzone)	2023	Through Council Disaster Management co-ordinator and processes.	Council (Eng Dept)	LDMG stakeholder partners	-	Council, State grants
			2.3.2	Provide early warning training to the Burke community using updated technologies (e.g. organise community resilience day, use social media)	Annually	Through Council disaster and engagement officers	Council (CEO)	LDMG stakeholder partners	-	Council, State grants
			2.3.3	Prepare new Storm Tide Guide and guidance for residents	2023	Through Council disaster and engagement officers	Council (CEO)	LDMG stakeholder partners	-	Council, State grants

Table 6. Modifying infrastructure – Implementation of actions

Theme	Adaptation action no.	Description	Priority adaptation actions	Estimated timeframe/priority	How to be implemented / mechanism	Lead agency	Supporting parties	Estimated budget requirements	Funding sources	
3. Modifying infrastructure	3.1 Resilient infrastructure	Modifying critical infrastructure (e.g., raising levels)	3.1.1	Review at risk infrastructure (from the Strategy technical outputs) and embed risks into current asset management plans. This could include 'betterment' at critical asset refurbishment/ renewals points.	Ongoing	Council team to update asset management plans based on technical outputs from Phase 5 and 6.	Council (Eng Dept)	Agency stakeholders State Government	-	-
			3.1.2	Review of road renewals and upgrades (prioritisation).	Ongoing	When undertaking maintenance or upgrades to road look for opportunities to slightly raise low lying roads.	Council (Eng Dept)	Agency stakeholders State Government	-	-
			3.1.3	Consult with utility providers on future services and upgrades and implications of coastal hazard areas.	Ongoing	Share new coastal hazard information presented in the Coastal Hazard Adaptation Strategy with utility providers	Council (Eng Dept)	Stakeholder partners – Utilities	-	-
			3.1.4	Consider developing specific coastal hazard overlay code in planning scheme updates Linked to action 2.1	2023	Council and/or planning consultants to prepare corresponding hazard overlay code	Council (CEO)	Consultants	-	-
	3.2 Resilient homes	Build homes following resilience guidelines and requirements.	3.2.1	Integrate resilient homes criteria in the planning approvals procedures	2023	Council and/or planning consultant to integrate in new planning scheme	Council (CEO)	Consultants	-	-
			3.2.2	Promote resilient homes within the community and building sector (link in with knowledge sharing initiatives).	Ongoing	Share resilient homes factsheet. Develop detailed guidelines	Council (CEO)	Consultants	\$10k	State Government grants
			3.2.3	Consider developing specific coastal hazard overlay code in future planning updates. Linked to action 2.1	2023	Council and/or planning consultants to prepare corresponding hazard overlay code	Council (CEO)	Consultants	-	-
	3.3 Relocate infrastructure	Relocate critical infrastructure	3.3.1	When updating asset management plans, consider the long term (2100) coastal hazard risk, and consider options for relocation if needed. Linked to 3.1.1 & 3.1.2	Ongoing	Council to update asset management plan accordingly	Council (Eng Dept)	-	-	-

Table 7. Coastal management and engineering – Implementation of actions

Theme	Adaptation action no.	Description	Priority adaptation actions	Estimated timeframe/priority	How to be implemented / mechanism	Lead agency	Supporting parties	Estimated budget requirements	Funding sources	
4. Coastal management and engineering	4.1. Nature based foreshore protection and maintenance	Minimise riverbank disturbance, maintain riparian vegetation	4.1.1	Create pilot riparian vegetation protection and maintenance programs at specific locations in collaboration with CLCAC	2023 – 2025	Integrate within existing CLCAC programs or create new programs	Council (Eng Dept)	CLCAC, community groups	\$20k p.a. to implement (materials costs, fencing, vegetation, expenses)	Council budget, grants
			4.1.2	Extend the dune and riparian vegetation protection and maintenance program to all relevant locations	2025 onwards	Extend program to identified priority areas, apply learnings from pilot program	Council (Eng Dept)	CLCAC, community groups	\$50k p.a. to implement (materials costs, fencing, vegetation, expenses)	Council budget, grants
			4.1.3	Continue and expand the rubber vine eradication program along tidal waterways and riverbanks	Ongoing	Continue and expand existing program	CLCAC	Council	-	-

Theme	Adaptation action no.	Description	Priority adaptation actions	Estimated timeframe/priority	How to be implemented / mechanism	Lead agency	Supporting parties	Estimated budget requirements	Funding sources	
			4.1.4	Link to 1.3 monitoring activities for marine pollution reduction and mangrove monitoring Marine Pollution Reduction and Mangrove monitoring	Ongoing	Continue and expand existing program	CLCAC	Council	-	-
	4.2 Last line of defence structures	Rock and revetments and riverbank protection and stabilisation to reduce the risk and impact of tidal erosion	4.2.1	Monitor erosion areas at key sites along rivers and waterways	2022	Create a monitoring program to observe and understand erosion processes at key sites along the Albert River or on the remote open coast foreshore	Council (Eng Dept)	CLCAC	\$5K	Council, grants
			4.2.2	Identify possible funding sources to implement works if triggered	2022	Direct contact with State Government agencies (DES)	Council (Eng Dept)	State Government	-	-
	4.3 Structures to minimise inundation	Consider the potential for the construction of levees to protect the town from tidal floods	4.3.1	Identify funding sources for preliminary feasibility study	2030 (or earlier if triggered)	Monitor opportunities for funding for feasibility study for structure to minimise floods to the town.	Council (Eng Dept)	State Government	-	-
			4.3.2	Monitor inundation risk and create triggers	2030 (or earlier if triggered)	Monitor water levels and changing risk in future flood events occurring during the wet season.	Council (Eng Dept)	State Government	-	-

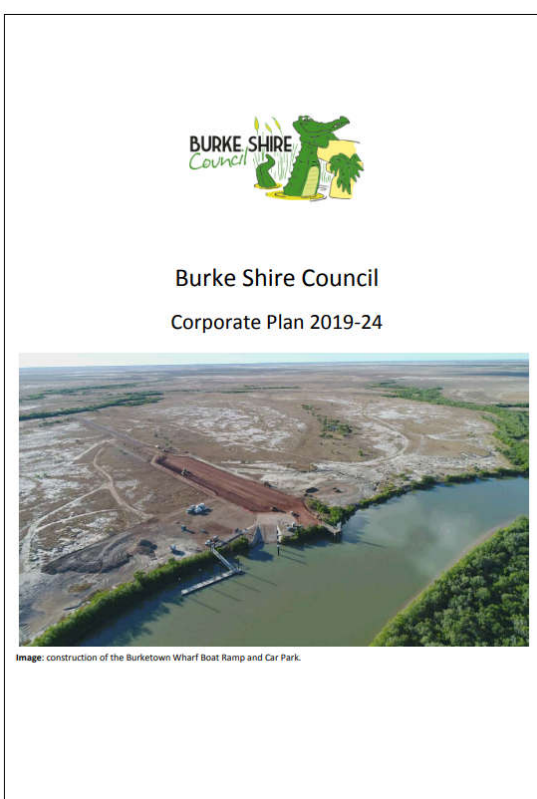
4.4 Additional principles for implementation

Corporate Plan

The Corporate Plan is the key strategic business plan for Council. It is a medium-term organisational directions document that describes Council's priorities for the future; informing the community of Council's intent. It provides a focused framework for Council to plan and undertake its business and service delivery for a period of 5 years and beyond, having regard to various issues which may have been identified during the planning process, including community engagement

The Corporate Plan is the mechanism by which Local Government Areas can allocate funding (not via statutory planning). It is used to drive the development of the annual Budget and Operational Plan. These in turn detail Council's actions and projects each year, showing how these strategies and outcomes will be resourced.

The current Burke Shire Council Corporate Plan runs to 2024. The updated Corporate Plan will point to the Coastal Hazard Adaptation Strategy and actions via Council's Themes/Goals for the next 5 years. This will ensure that Council can allocate funding and associated workforce planning linked to the delivery of the Coastal Hazard Adaptation Strategy.



Planning and planning controls

Based on the output of the update CHAS mapping, Council will explore the options for creating a coastal hazard overlay as part of the next planning scheme, which will reflect the most up to date mapping, enable full consideration of risk and opportunities for future land use planning and align with the State Planning Policy (2017).

Council will implement land use planning action 2.1 (including all sub-actions) of the Coastal Hazard Adaptation Strategy (Table 5). Council will continue to review the planning approach and controls during the implementation of the Coastal Hazard Adaptation Strategy and with the Strategy 10 year review (or if triggered earlier).

Other relevant instruments relevant to planning in coastal areas include:

- The Coastal Protection and Management Act 1995
- Coastal Management Districts
- The 2100 State defined Erosion Prone Area
 - Calculated erosion distance
 - HAT + 40 m landward of plan position
 - HAT + 0.8 m vertical elevation
- Mean High Water Springs (MHWS) + 40m.

The 'temporary local planning instrument' – can also be used to get priority actions implemented prior to the next Planning Scheme update if required (e.g. a development pause until Planning Scheme amendment can be completed).

For existing dwellings within the coastal hazard prone areas, planning regulations can only have an impact when changes are proposed that trigger a development application.

Triggers for change in adaptation response

As set out in the Coastal Hazard Adaptation Strategy, an adaptation response has been identified for different localities across the region, for present day, 2050, and 2100 planning horizons. The adaptation response is defined as either avoid, monitor, mitigate, or transition (Figure 4) depending on the changing risk profile (geographically and over time).

Adaptation response	Coastal hazard adaptation			
	Avoid	Monitor	Mitigate	Transition
	Avoid placing new development or assets in coastal hazard areas.	Monitor the risk of coastal hazards. Monitor until local trigger levels are reached to initiate mitigation.	Actively mitigate the risk of coastal hazards through a range of adaptation options. Mitigate until local trigger levels are reached to initiate transition.	A strategic decision to transition to an alternative landuse in some areas. Mitigation may be part of the transition process.
Adaptation options		Monitoring and initiatives to enhance adaptive capacity	Full range of adaptation options	

Figure 4. Adaptation framework for the Coastal Hazard Adaptation Strategy

Triggers that may initiate a review of the adaptation response or actions prior to scheduled review of the Coastal Hazard Adaptation Strategy (2031, then every 10 years) include:

- A change in the science / policy environment, in particular the 2100 sea-level rise benchmark set by State Government
- A major coastal hazard event that exceeds damage expectations (at one or several localities)
- Proposed amendments to the Planning Scheme within the 2100 Erosion Prone Area
- New information on the changing risk profile and/or emerging best practice in adaptation
- If community attitudes and risk tolerance changes
- A strategic decision by Council linked to other strategic objectives.

Monitor to Mitigate: A shift from monitor to mitigate would be most likely linked to an observed change in the risk profile, identified through the MER process (see Section 4.7), a major coastal hazard event and observed consequence, or a change in the sea-level rise estimates included in the long term coastal hazard extent estimates (2100).

Mitigate to Transition: A shift from mitigate to transition could equally be triggered by all the aforementioned triggers, however, will also require a review of the effectiveness of the priority 5-10 year activities set out in the Coastal Hazard Adaptation Strategy to mitigate risk.

The Coastal Hazard Adaptation Strategy seeks to deliver adaptation actions that will work together in an integrated way to mitigate coastal hazards. Council will review the effectiveness of actions at the first Strategy review in 2031 (unless triggered earlier), and a review of the adaptation response will be undertaken at that time.

If a transition response is pursued in the future, there are a range of mechanisms Council may explore to facilitate this, including rezoning (that could feed into future Planning Scheme updates), land buy-back, and land-swap programs. If rezoning is triggered this will require careful consideration as compensation may be required (this is very reliant on site-specific information and conditions).

Links to disaster management

The Coastal Hazard Adaptation Strategy will inform updates to the Local Disaster Management Plan (strategic action 2.2.1). This will be completed by the local disaster management co-ordinator and in consultation with the Burke Local Disaster Management Group (LDMG).

Outputs from the Coastal Hazard Adaptation Strategy that are particularly relevant to updating disaster management arrangements include the storm tide mapping from Phase 3, the coastal hazards risk assessment and the economic analysis.

4.5 Change management

A summary of potential barriers to implementation and associated strategies to overcome barriers, plus consideration of how the Coastal Hazard Adaptation Strategy incorporates these strategies, as well as change management actions required for the future, is provided in Table 8.

Table 8. Potential barriers to implementation

Potential barriers to implementation	Strategies to overcome barriers	How strategies are incorporated into the Strategy	Future change /action
<i>Financial</i>			
Lack of funding security	- Seek innovative funding methods	Range of funding methods considered (Section 4.6)	Maintain and promote stakeholder partnerships for joint funding applications.
Receiving funding for capital works costs only (i.e. no funding for ongoing maintenance/operations)	- Seek opportunities to partner with other agencies/organisations	Costs included in Strategy (Section 4.3)	
Lack of funding for monitoring, evaluation and review	- Ensure ongoing maintenance costs are considered and incorporated in regular budget process - Ensure monitoring, evaluation and review costs are considered and incorporated in regular budget process	MER costs included in Strategy (Section 4.3)	
<i>Organisational culture</i>			
Staff lack the skills/knowledge to implement strategy	Ensure that staff are provided with the appropriate training and resources to increase their knowledge and skills Consider employing staff with specialist skills or creating a dedicated position to implement the strategy	Building capacity is a key component of the Strategy. The Strategy nominates a dedicated position to implement the Strategy. Key strategies and documents to be updated (including Corporate Plan, LDMP).	Recruitment of additional specialist skills may be beneficial. Maintain dialogue across Council on the rationale for implementing the range of actions in the strategy.
Staff fail to embed strategy in their day to day tasks	Ensure that all council strategies, plans and documents are updated to incorporate relevant aspects of the strategy	Strong staff awareness and buy-in created during the development of the Strategy across teams and with individual champions within Council.	
Strategy is not embedded in the day to day operations of the council	Ensure that all staff have an understanding of the importance of and rationale for implementing the strategy Ensure that staff understand any changes in their responsibilities as a result of implementing the strategy Establish change champions within the organisation to inspire change Ensure management leads by example in implementing the		

Potential barriers to implementation	Strategies to overcome barriers	How strategies are incorporated into the Strategy	Future change /action
	strategy Engage any new staff in the strategy early		
<i>Monitoring, evaluation and review (MER)</i>			
Monitoring, evaluation and review does not achieve its intended outcome	Ensure appropriate funding is allocated for monitoring, evaluation and review	Funding allocation in Strategy	Staff member takes ownership of the MER process and consistency in the review.
Monitoring, evaluation and review is not completed thoroughly	Ensure that sufficient time is provided to monitoring, evaluation and review Ensure that monitoring is appropriately designed Ensure that monitoring and review has cleared defined objectives that are not simply to fulfil legislative or other requirements	Simple and targeted MER process developed (Section 4.7) for specific objectives.	
<i>Partnerships</i>			
Partner organisations fail to complete actions they have responsibility for	Build and maintain strong relationships with partner organisations	Strategic actions included in the Strategy to grow and strengthen these partnerships.	Will need a champion within Council to drive/build the partnerships through organising meetings, fostering relationships and seeking opportunities.
Partner organisation messaging contradicts council messaging about coastal hazards	Ensure that partner organisations are involved in and have an opportunity to comment on the strategy and its implementation		
<i>Community</i>			
Community opposition to strategy hinders implementation	Regular, meaningful engagement with the local community Frame communications in different ways to appeal to the community's values	Website to remain live for implementation and future communications. Inclusive dialogue on present day and future hazards is incorporated into the Plan.	Future briefings required to keep the dialogue and language going throughout implementation – new staff and stakeholders to be briefed / inducted.
Community opposition to climate change science informing the strategy hinders implementation	Ensure the dialogue is inclusive of present day coastal hazard risk, and a precautionary risk management approach for the future (that includes sea level rise).		
<i>Action prioritisation</i>			
Actions are not prioritised	Ensure prioritisation of actions, along with details of any interdependencies between actions.	Actions prioritised by timing of implementation over the next 10 years. Number and budgeting of actions has been set with achievable targets in mind for Council.	'Ongoing' / 'annual' actions will need a champion to ensure they are completed regularly.
Many actions become unattainable, especially with limited resources and/or funding	Define responsibilities for resourcing and funding actions. Develop realistic and practical timeframes for implementation.		

4.6 Funding mechanisms

Council's own source revenue is inadequate to support the majority of the actions contained within this report, as such it is reliant on a range of funding mechanisms available to support delivery of the Strategy initiatives, as outlined in Table 9.

Table 9. Potential funding mechanisms (adapted and updated from Griffith Centre for Coastal Management 2012)

Funding mechanism	Description	Relevant authority
RATES, LEVEES, CONTRIBUTIONS		
Rates and charges	The use of special rates to fund a project spanning more than one year.	BSC
Environmental levies	LGAs can impose environmental levies to landholders as part of annual rate collection. Funds collected from these levies are held separately from Council's general revenue. Levies could be zoned based on exposure to coastal hazard risk / distance from coast or hazard area.	BSC
Developer contribution and infrastructure agreements	Developer contributions are upfront user charges for future infrastructure services, which are generally required prior to construction. These contributions are applicable only to 'trunk infrastructure', are capped at a maximum value and are controlled by the State. Infrastructure agreements are generally associated with larger developments and comprise agreements between a developer and the local government to provide necessary infrastructure in lieu of infrastructure charges. LGAs may apply for either one mechanism or the other, not both.	BSC
EXTERNAL FUNDING SOURCES FOR LOCAL GOVERNMENT		
Federal Government	There are a range of federal government grants that local governments may be eligible to apply for including; <ul style="list-style-type: none"> Solve urban challenges and improve community liability Environment Restoration Fund Improving your local parks and environment Blue Carbon Ecosystems Increasing Australia's Resilience National Environmental Science Program Managing Disaster Risk program. 	Commonwealth Government
Natural Disaster Relief and Recovery Arrangements (NDRRA)	NDRRA is a disaster response and recovery assistance program designed to assist LGAs to restore essential public assets to their pre-disaster standard. Funding for ongoing resilience projects is not typically available under standard NDRRA arrangements. However, 'betterment' funding often becomes available under a specific category.	Queensland Reconstruction Authority (QRA)
Queensland Resilience and Risk Reduction Funding (QRRRF)	This funding is to help reduce, mitigate and manage the risks of disasters and to make Queensland communities and infrastructure more resilient to disasters.	Queensland Reconstruction Authority (QRA)
Government borrowing	Government borrowing can provide LGAs with funds to undertake works in the short term, however, this would require additional revenue raising through other means.	State Government

Funding mechanism	Description	Relevant authority
Growth Area Bonds	Issue of bonds to finance infrastructure enhancement that are tied to a specific area and repaid through future tax revenues collected in a defined area.	Private sector
Business Improvement Districts	Stakeholders within a defined boundary make a collective contribution towards the maintenance and promotion of an area	Private sector
Local Government Grants and Subsidies Program	The Local Government Grants and Subsidies Program (LGGSP) aims to support local governments to meet the needs of their community by providing funding for the delivery of priority capital infrastructure projects, including protecting natural and built environments. .	State Government
Other State Government funding	Potential funding for projects of State significance or interest.	State Government
FUNDING SOURCES AND PROGRAMS FOR COMMUNITY INITIATIVES		
Environmental stewardship and volunteering groups	Landcare	Non-for profit groups
Australian Government programs	<p>A range of programs, updates available at https://www.grants.gov.au/</p> <p>There are a range of federal government grants for community groups and research as outlined below.</p> <p>Community Groups:</p> <ul style="list-style-type: none"> • Community Environment Program • Environment Restoration Fund • National Landcare program • Building environmental-friendly communities • Indigenous Protected Areas - Sea Country • Resources and training for Aboriginal and Torres Strait Islanders. <p>Delivery through research partnerships and shared funding arrangements:</p> <ul style="list-style-type: none"> • ARC Grants • Collaboration with ARC Centres of Excellence • CRC Grants • CRC-P Grants • Grants for innovative STEM programs. 	Commonwealth Government
Private sector grants	Many private companies/organisations provide one-off grants for environmental improvement projects.	Private sector
Queensland Climate Resilient Councils (QCRC)	The Queensland Climate Resilient Councils (QCRC) program is working with Queensland local governments to deliver services and products that will strengthen staff and leadership team skills and capacity to plan for and respond to the challenges and opportunities arising from climate change.	LGAQ / DES
QCoast ₂₁₀₀ 2.0	LGAQ QCoast ₂₁₀₀ funding for implementation and pilot projects	LGAQ / DES

4.7 Monitoring, evaluation and review

A tailored monitoring, evaluation and review (MER) process for the Coastal Hazard Adaptation Strategy has been developed to enable progress of the Strategy to be evaluated, and facilitate adaptive management.

The MER process focuses on being able to report on key objectives linked to success of the Strategy and is intended to be embedded into Council's routine MER processes for existing plans and strategies. Specific Strategy actions may also be incorporated in existing tailored MER processes linked to asset management, corporate and strategic planning, and disaster management.

Objectives, monitoring and evaluation

Key objectives, proposed indicators of progress and monitoring and evaluation activities are outlined in Table 10.

Table 10. MER process

Objectives	Indicators of progress	Monitoring	Evaluation
Strategy actions have been integrated into Council and stakeholder plans and processes	<ul style="list-style-type: none"> - Corporate Plan and other strategic plans have been updated to reference the most recent update of the Coastal Hazard Adaptation Strategy - Strategic Plans of key stakeholders have reference to the Coastal Hazard Adaptation Strategy or synergies/actions with the Plan 	Annual review of plans and strategies	Relevant Plans updated or in progress of being updated
Actions have been completed on-schedule	<ul style="list-style-type: none"> - Number of actions in progress - Number of actions completed 	Annual review of actions in progress or completed.	Greater than 50% of actions in progress or completed on-schedule
On-ground activities have been delivered	<ul style="list-style-type: none"> - Number of actions delivered on ground - Capital budget expended - Maintenance budget expended 	Annual review of actions in progress or completed	Greater than 50% of actions in progress or delivered on-schedule and budget expended
Stakeholder partnerships continue to strengthen	<ul style="list-style-type: none"> - Number of people/stakeholders/groups involved in delivery of actions - New partnerships formed 	Annual review of actions and stakeholder involvement	<p>Stakeholder partners are maintained</p> <p>New partnerships are formed</p>
Actions have achieved indented outcome – e.g. increased resilience of the region to coastal hazards	<ul style="list-style-type: none"> - Where on-ground actions are implemented, coastal hazard risk is reduced - Capacity building results in increased awareness of coastal hazards and adaptation options (stakeholders and community) - Capacity building results in increased stakeholder involvement in coastal hazard adaptation actions 	<p>Coastal hazard risk monitoring informed by actions 1.3 (monitoring) in the Strategy.</p> <p>Annual poll of stakeholder awareness and involvement in implementing actions from the Strategy</p>	<p>Expected reduction in coastal hazard risk are achieved where on-ground actions are implemented (after establishment periods)</p> <p>A steady increase in the number of stakeholders aware of and involved in delivering the Coastal Hazard Adaptation Strategy.</p>

Reporting and review

A short annual report on the progress of the Coastal Hazard Adaptation Strategy implementation should be produced as part of Council's regular reporting processes.

The Coastal Hazard Adaptation Strategy will be reviewed every 10 years, commencing at least 2 years prior to the Planning Scheme review which is undertaken on a 10 year timeframe. The next review of the Coastal Hazard Adaptation Strategy will commence in 2031.

The review will include consideration of:

- Any changes in the policy environment (e.g. sea level risk predictions, approach to defining coastal hazard areas)
- Updated technical information that may be available
- Any new development and landscape changes in the region, including any changes to the Planning Scheme within the 2100 Erosion Prone Area.

As noted previously, a review of the Strategy (and adaptation response) may also be triggered prior to the scheduled review due to:

- A change in the science / policy environment, in particular the 2100 sea-level rise benchmark set by State Government
- A major coastal hazard event that exceeds damage expectations (at one or several localities)
- Proposed amendments to the Planning Scheme within the 2100 Erosion Prone Area
- New information on the changing risk profile and/or emerging best practice in adaptation
- If community attitudes and risk tolerance changes
- A strategic decision by Council linked to other strategic objectives.



Burketown boat ramp on the Albert River

5 References

BSC (2019a). Coastal Hazard Adaptation Strategy Phase 1 Summary Report. Report by BMT to Burke Shire Council.

BSC (2019b). Coastal Hazard Adaptation Strategy Phase 2 Summary Report. Report by BMT to Burke Shire Council.

BSC (2020a). Burke Shire Council: Coastal Hazard Adaptation Strategy (CHAS) Phase 3 – 6. Phase 3 Summary report. Report by Alluvium, NCE and JBP to Burke Shire Council

BSC (2020b) Burke Shire Council: Coastal Hazard Adaptation Strategy (CHAS) Phase 3 – 6. Phase 4 Summary report. Report by Alluvium, NCE and JBP to Burke Shire Council

BSC (2020c) Burke Shire Council: Coastal Hazard Adaptation Strategy (CHAS) Phase 3 – 6. Phase 5 Summary report. Report by Alluvium, NCE and JBP to Burke Shire Council

BSC (2021a) Burke Shire Council: Coastal Hazard Adaptation Strategy (CHAS) Phase 3 – 6. Phase 6 Summary report. Report by Alluvium, NCE and JBP to Burke Shire Council

BSC (2021b) Burke Shire Council: Coastal Hazard Adaptation Strategy (CHAS) Phase 3 – 6. Phase 7 Summary report. Report by Alluvium, NCE and JBP to Burke Shire Council

BSC (2021c) Resilient Coast – Resilient Gulf - Burke Shire Council Coastal Hazard Adaptation Strategy. <https://www.burke.qld.gov.au/downloads/file/734/coastal-hazard-adaptation-strategy>

Griffith Centre for Coastal Management (2012). Coastal hazard adaptation options – A compendium for Queensland coastal councils. Prepared for GHD Pty Ltd, Dept. of Environment and Heritage Protection, Local Government Association of Queensland, Townsville City Council and the Commonwealth Dept. of Climate Change and Energy Efficiency. Oct 2012.

LGAQ & DEHP (2016). QCoast2100 Developing a Coastal Hazard Adaptation Strategy: Minimum Standards and Guideline for Queensland Local Governments. Local Governments Association Queensland and Department of Environment Heritage and Protection, QLD.