QUEENSLAND COASTAL COUNCILS CLIMATE CHANGE ADAPTATION ACTIVITIES SURVEY OUTCOMES

DRAFT REPORT

VERSION CONTROL

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Final draft for acceptance – V.1	Dorean Erhart	12 Dec 2011
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Local Government Association of Queensland Ltd

16

DECEMBER 2011

The Local Government Association of Queensland (LGAQ) is the peak body for local government in Queensland. It is a not-for-profit association setup solely to serve councils and their individual needs. LGAQ has been advising, supporting and representing local councils since 1896, allowing them to improve their operations and strengthen relationships with their communities. LGAQ does this by connecting councils to people and places that count; supporting their drive to innovate and improve service delivery through smart services and sustainable solutions; and delivering them the means to achieve community, professional and political excellence.

Executive Summary

Introduction

The Coastal Councils Adaptation Taskforce (C-CAT) is being formed to collectively improve the capacity of Queensland coastal local government to adapt to coastal climate change challenges.

The establishment phase of C-CAT has representatives from 21 councils on the Establishment Committee working together to develop a proactive agenda and work plan for the Taskforce.

The *Queensland Coastal Councils Climate Change Adaptation Activities Survey* was designed to gain a snapshot of current coastal council adaptation activities, gather examples of best practice adaptation activities and collect further information on councils' priorities and needs to assist them in undertaking coastal climate change adaptation activities.

The information collected will further add to and confirm the priorities in the draft C-CAT work plan, establish a benchmark to enable measurement of the C-CAT work plan's effectiveness over time and provide information for the development of a product that will enable sharing of information, advice and best practice examples between Queensland coastal councils.

Response rate

The survey was circulated to all 32 Queensland coastal councils. Thirteen coastal councils responded, however only twelve completed the entire survey. All participants were C-CAT councils, representing a 57% response rate from councils participating in the establishment phase.

Respondent councils were equally represented by small (3 <100,000 pop.), medium (3 >100,000pop.) and large (3 >300,000pop.) regional councils with one metro council (>1M pop.) and one very small regional council (<10,000 pop.) also providing responses.

Summary of survey results

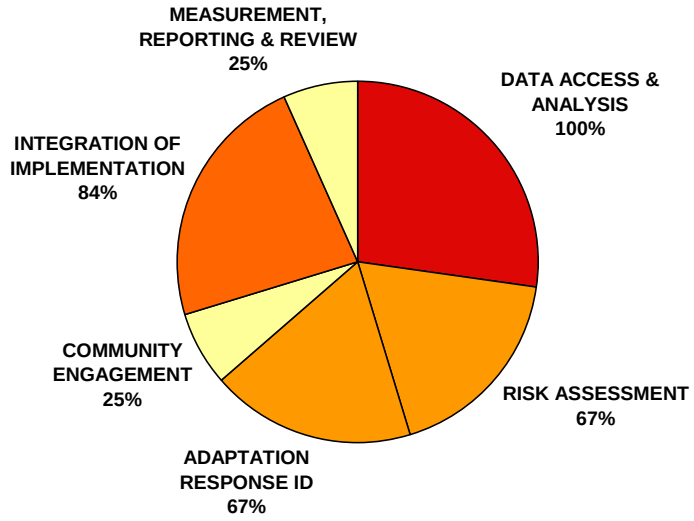
Climate change adaptation readiness has a number of clear activity areas, with stakeholder communication, consultation and engagement occurring across each area:

- Data access, analysis and communication;
- Risk assessment and prioritisation;
- Developing coastal climate change adaptation responses;
- Community engagement and consultation;
- Corporate and community integration of coastal climate change adaptation; and
- Measurement and reporting.

The survey was structured to allow assessment of the level of activity within each area by respondent councils. Additionally, some of the survey responses provided insight into what could be drivers to undertaking particular activities.

Activity in relation to climate change adaptation by responding councils in each of the activity areas is described in the diagram below. Darker colours indicate higher levels of capacity and activity than the lighter colours and numbers represent the percentage of respondents indicating they are undertaking some level of activity in the respective area.

Council Participation Levels in Key Activity Areas (n=12)



It is important to note that within each activity area, there is a high level of variability in terms of type and extent of activity, with access to GIS technology being the only area where all councils had some capacity and capability.

The results show that responding councils overall are in the early stages of climate change adaptation activity, with one or two exceptions.

Key drivers for undertaking actions are:

- Staff initiative;
- Local Adaptation Pathways Program grant funding; and
- Legislative requirement.

The survey results indicated that councils are willing to share information about methodologies, experiences in undertaking activities, data and innovations such as:

- Integration of climate change into procurement and project planning requirements;
- Staff induction and training information;
- Community resilience incentive grants;
- Climate change impacts statements;
- Consideration of wetlands as ‘soft’ stormwater infrastructure assets; and
- Partnering with research organisations to understand the costs of inundation from an economic analysis perspective.

Respondents were clear that they want the State government to provide appropriate methodologies, technical information and guidelines to facilitate better stakeholder consultation and engagement and development of in-house knowledge and expertise, which they see as the domain of local government.

Full survey results are available in Attachment 1.

Summary of conclusions

The overall progress of responding councils toward adaptation readiness is relatively low to moderate when taking into consideration the high level of awareness of the need to act, length of time of awareness and potential consequences of not acting.

The National Climate Change Adaptation Research Facility was established in 2007 as was the CSIRO Climate Change Adaptation Flagship. The same year, the LGAQ released the Adapting to Climate Change Guideline for local government and the State Government formed the Office of Climate Change and the Queensland Centre for Climate Change Excellence. The Australian Government released grant funding through the Local Adaptation Pathways Program in 2008 and 2009.

As a result of these activities, initiatives and programs, there is a high recognition of the need to undertake adaptation activities, particularly at the staff and executive level and to a lesser extent, elected member level. However, the results of the survey point to a number of significant barriers resulting in low levels of confidence by local government to take action.

The survey results found priority needs to enable further progress in the short and medium term are:

- Appropriately scaled data (only 25% have Sea Level Rise/Inundation data and 50% have flood data);
- Appropriate methodologies and guidelines (across most activity areas, but especially with regard to understanding vulnerability);
- Access to technical information (particularly about cost effective adaptation responses);
- Improved organisational prioritisation;
- Legislative framework (clarity of roles and responsibilities); and
- Activation of funding streams.

Until these needs are substantially met, local governments are likely to remain reluctant to act, in the event they inadvertently expose themselves to legal and organisational risks.

Introduction

The Coastal Councils Adaptation Taskforce (C-CAT) is being formed to collectively improve capacity to adapt to coastal climate change challenges through an alliance of Queensland coastal local governments.

C-CAT is currently in the establishment phase with Establishment Committee representatives from 21 councils participating in the development of a proactive agenda and work plan for the Taskforce.

The *Queensland Coastal Councils Climate Change Adaptation Activities Survey* was designed to:

- gain a snapshot of current coastal council adaptation activities;
- identify councils priority needs to assist them in undertaking coastal climate change adaptation activities; and
- gather examples of best practice adaptation activities.

The information collected will be used to:

- Confirm the priorities in the C-CAT work plan;
- Establish a benchmark to enable measurement of the C-CAT work plan's effectiveness over time; and
- Build a body of best practice examples and adaptation knowledge to be shared among coastal councils.

The survey deals with coastal climate change adaptation, which covers the impacts of: sea level rise; storm surge; coastal erosion and accretion; concurrent inland flooding and cyclones. It does not specifically cover: mitigation issues generally; increased temperatures; or changes to rainfall. It is acknowledged that some of the work done by councils will have given consideration to these things however, it is not a focus of this survey.

Each section of the survey covers a specific area of work that a council will need to undertake to address coastal adaptation requirements. These areas of activity are:

- Data access, analysis and communication;
- Risk assessment and prioritisation;
- Developing coastal climate change adaptation responses;
- Community engagement and consultation;
- Corporate and community integration of coastal climate change adaptation; and
- Measurement and reporting.

Response rate

The survey was circulated to all 32 Queensland coastal councils. Thirteen coastal councils responded, however only twelve completed the entire survey. All participants were C-CAT councils, representing a 57% response rate from councils participating in the establishment phase.

It is important to note that a number of other councils had viewed the survey, determined that they had not undertaken any of the activities and elected not to participate. This has implications for gaining an understanding of the needs of these councils, particularly in relation to C-CAT's work plan and how best to respond to meet all C-CAT councils' needs.

All council respondents provided their conditional or outright permission for information provided to be used in the development of a product that will enable information, advice and product exchange between councils.

Survey Outcomes

Following is a summary of the survey outcomes gathered and conclusions to be gained from the results. Information gathered about specific needs from each council will be integrated into the proposed C-CAT work plan.

All survey graphs and tables are available in Attachment 2, however, individual councils are not identified. The Establishment Committee proposes that one of the first actions of C-CAT is to bring together the information from this survey, with permission from participating councils and provide a compendium of who has done what and what products are available from which council. This information is to be made available to all participating councils.

SECTION 1: Data access, analysis and communication

Summary of outcomes

All twelve respondents have the technology in place to utilise available data. Most (11 of 12) have the in-house expertise to undertake some level of analysis. One third of respondents indicated they have Spatial, 3D and Network capability.

Half of the respondents use MapInfo and the other half use ArcGIS.

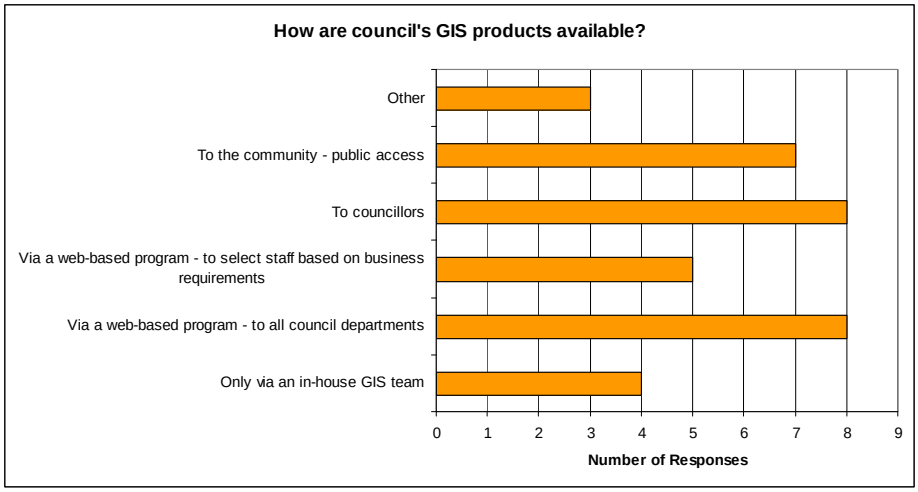
Comments indicate that levels of ability in terms of data analysis and product generation is predominantly limited by computing capacity (the ability of the system to 'run' large amounts of data) and to a lesser extent, the availability of skilled staff to undertake the work.

Results show a wide range in capability with one council noting it is able to run its own digital elevation modelling, while another commented that it had no specific in-house GIS analysis expertise available.

Most commonly held data:

- Storm Surge Modelling 90%
- Natural Assets Mapping 90%
- Infrastructure and assets 85%
- Flooding 50%

Availability of products is generally good, with eight of the twelve councils having products available via a web-based program to all council departments and councillors and seven providing products to the general public (see table below).



An overwhelming majority (90%) of respondents rated vulnerability mapping as a top 3 priority, while 60% require sea level rise inundation/coastal hazard mapping.

Further investigation is required to clarify whether the current Queensland Coastal Plan Coastal Hazard Mapping is considered adequate. Councils north of Lucinda in Far North Queensland are yet to receive this mapping.

The third most mentioned priorities were vulnerability analysis and flood mapping.

Two councils identified modelling of overland flow paths and the confluence of storm surge and catchment flood effects.

Conclusions

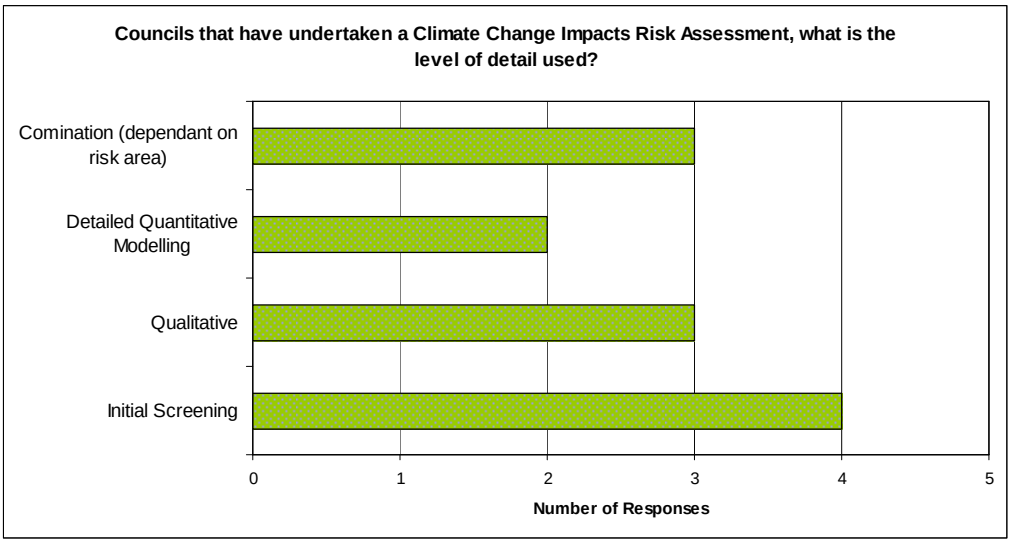
1. There are opportunities for sharing information between councils as the technology platforms (MapInfo & ArcGIS) are not mutually exclusive.
2. There are opportunities for sharing data analysis and modelling methodologies between councils.
3. If data is provided, all respondent councils have the capacity to utilise it to some extent.
4. There is an opportunity to make significant improvements in council capability through improving councils' data analysis capabilities (improved technology and skilled resources) and providing access to catchment flood and Sea Level Rise data and modelling.
5. The respondents highlighted the need for vulnerability mapping and analysis to enable councils to identify and understand vulnerability to coastal climate change hazards at the asset, social, environmental and economic levels. It is important not to understate the importance of this requirement, as it goes beyond understanding what is in the path of a future hazard to also assessing its capacity to withstand the impact and the socio-economic sensitivity to recover from the impact. This work is resource intensive, requires multi-disciplinary expertise, large amounts of data and consistent, repeatable methodologies.

SECTION 2: Risk assessment and prioritisation

Summary of outcomes

Eight of the twelve respondents (67%) have undertaken some form of risk assessment. Six used consultants and four undertook the risk assessment as a result of accessing a Local Adaptation Pathway Program (LAPP) grant.

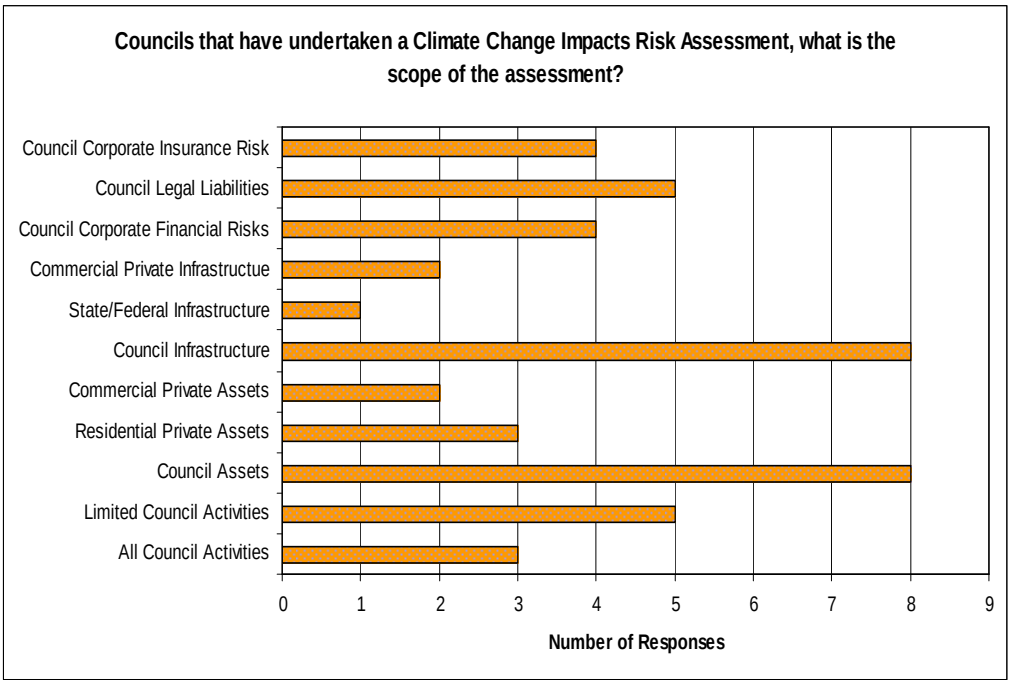
The level of detail used in the risk assessments varied, with 50% undertaking an initial screening of risks before doing more detailed work. Only two have undertaken detailed, quantitative modelling of risks.



All eight respondents had assessed council assets and infrastructure. Five out of eight had considered council's legal liabilities.

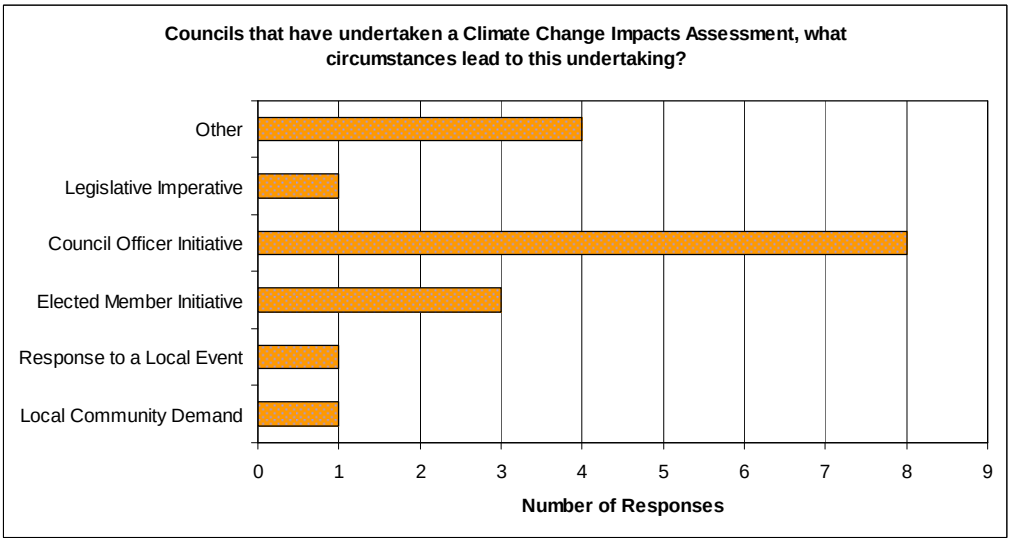
Other top considerations were corporate insurance risk and corporate financial risk.

Only three had considered all councils activities and risks to residential assets.



Results show a high level of recognition by staff in particular of the need to begin understanding their council's risk exposure under climate change (100% of respondents).

Significantly, nearly 40% cited elected members as also initiating the requirement for risk assessments in their respective councils.



How and what has been assessed and to what level varies from council to council. Analysis of the priority needs however, provide some insights into this variability. The most cited need was 'organisational prioritisation' (5).

The next most cited needs (4 times each) were:

- funding;
- Coordination across the organisation;
- In-house knowledge and skills; and
- A legislative framework to provide for clear roles and responsibilities at all three levels of government and certainty for decision making.

The third highest priority needs were:

- Data; and
- Stakeholder engagement and communication.

Conclusions

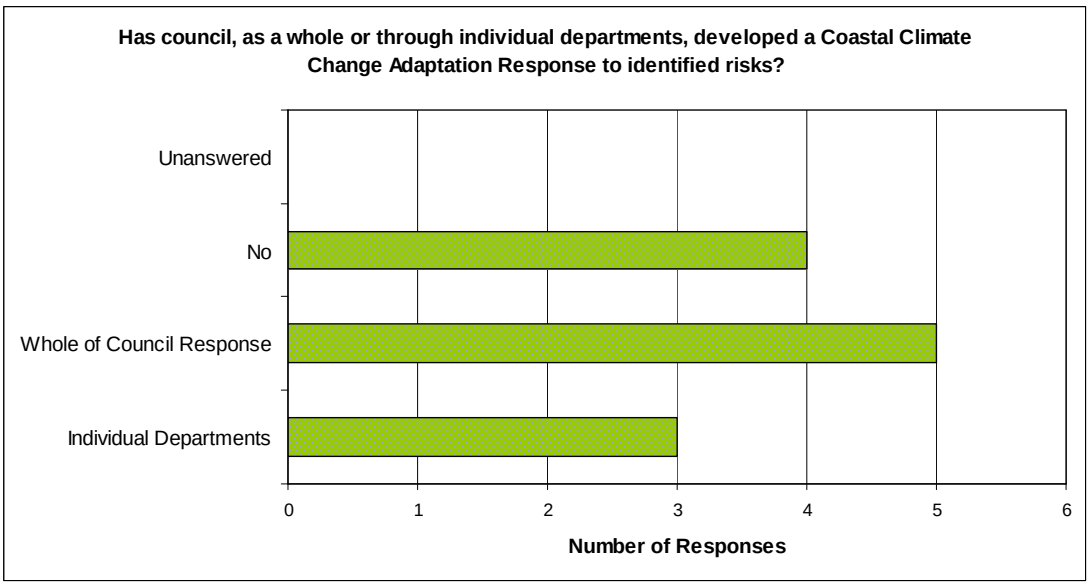
1. Councils that received LAPP funding from the Australian Government have continued to invest in further risk assessment work, indicating that these grants have helped to 'kick start' the process within receiving councils.
2. There are opportunities to significantly increase the initiation of risk assessments and coordination across the organisation through improving elected member support and accessing 'start up' funding.
3. There is a desire by some respondents for advocating for either a tri-partite agreement of roles and responsibilities or the establishment of a legislative framework to provide an organisational driver to respond to climate change adaptation needs generally and the need for risk assessments specifically.
4. There is a need to explore avenues for improving in-house knowledge and skills.
5. There are opportunities for councils to share methodologies and lessons from undertaking their respective risk assessments, in particular:
   - Stakeholder engagement;
   - Organisational coordination of data and stakeholder knowledge;
   - Methodologies for determining priorities; and
   - Organisational integration of outcomes.

SECTION 3: Developing coastal climate change adaptation responses

Summary of Outcomes

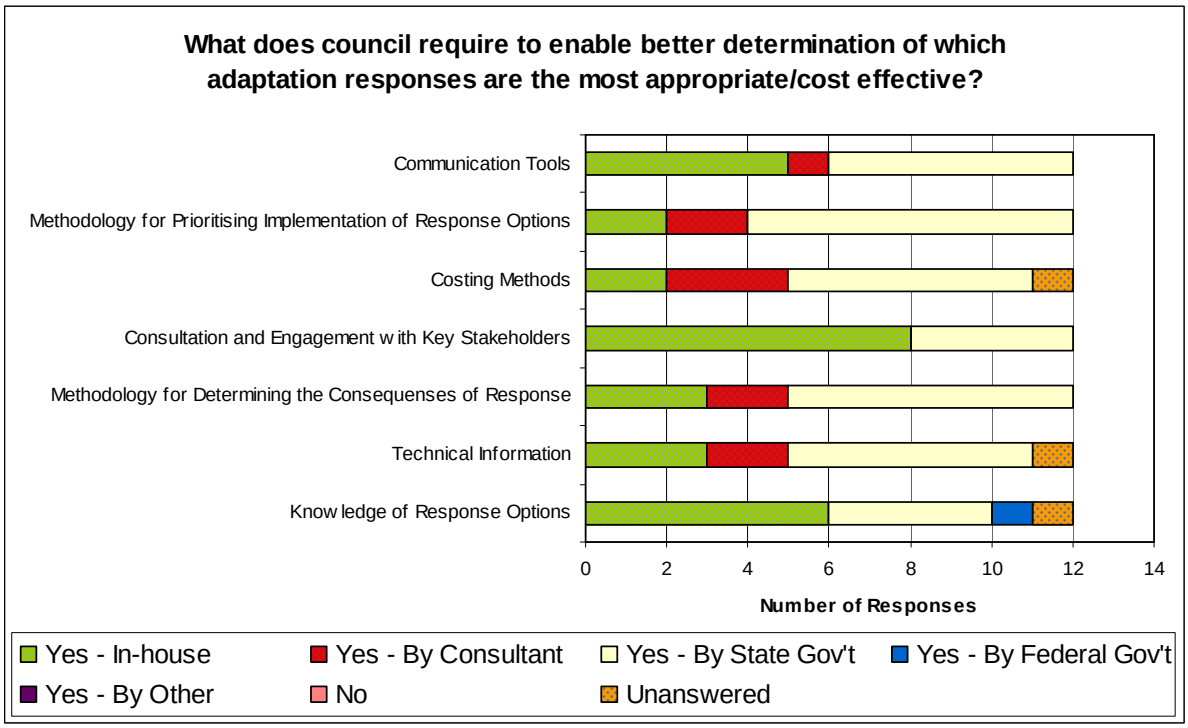
Five out of twelve respondents have developed a 'whole of council' response to coastal climate change adaptation needs.

Three of twelve have developed responses for an individual department, predominantly the planning department. This appears to be driven by the Sustainable Planning Act 2009 requirement to consider climate change in planning schemes and the imminent commencement of the Queensland Coastal Plan and associated State Planning Policy.



Of the eight respondents that had developed adaptation responses to climate change, 75% cited the action as a council staff initiative, 64% as a legislative imperative, and 38% local community demand.

Respondents clearly want the State government to provide appropriate methodologies, technical information and guidelines to facilitate better stakeholder consultation and engagement and development of in-house knowledge and expertise, which they see as the domain of local government.



Respondents (12) indicated their top three needs to enable better development of response options were:

- Funding;
- In-house knowledge and guidelines; and
- Legislative requirement.

Just under half of the respondents are seeking a legislative framework to enable responses to be developed without increasing councils' exposure to the risks of litigation or liability.

Information provided by the respondents on the range of responses developed revealed a diversity of activities with a number of innovative approaches that will be of interest to other councils, including:

- Integration of climate change into procurement and project planning requirements;
- Staff induction and training information;
- Community resilience incentive grants;
- Climate change impacts statements;
- Consideration of wetlands as 'soft' stormwater infrastructure assets; and
- Partnering with research organisations to understand the costs of inundation from an economic analysis perspective.

Conclusions

1. There are significantly lower participation rates in the development of coordinated adaptation responses than in previous sections, indicating that the majority of respondents are yet to adequately resolve information, capacity and organisational requirements to move into this phase of climate change adaptation.
2. This suggests that in the short term, greater priority should be given to facilitating risk assessment projects and providing tools to ensure results are appropriately detailed to allow councils to move forward into the consideration of adaptation options.

3. At the same time, there are opportunities for establishing consistent methodologies and tools for determining and prioritising adaptation options. This work should be done in partnership with those councils that are currently or moving into this phase of climate change adaptation.
4. There is a clear need to negotiate at the State and Federal level on the roles and responsibilities for the provision of methodologies, technical information and guidelines to improve in-house knowledge and skills within councils.

SECTION 4: Community engagement and consultation

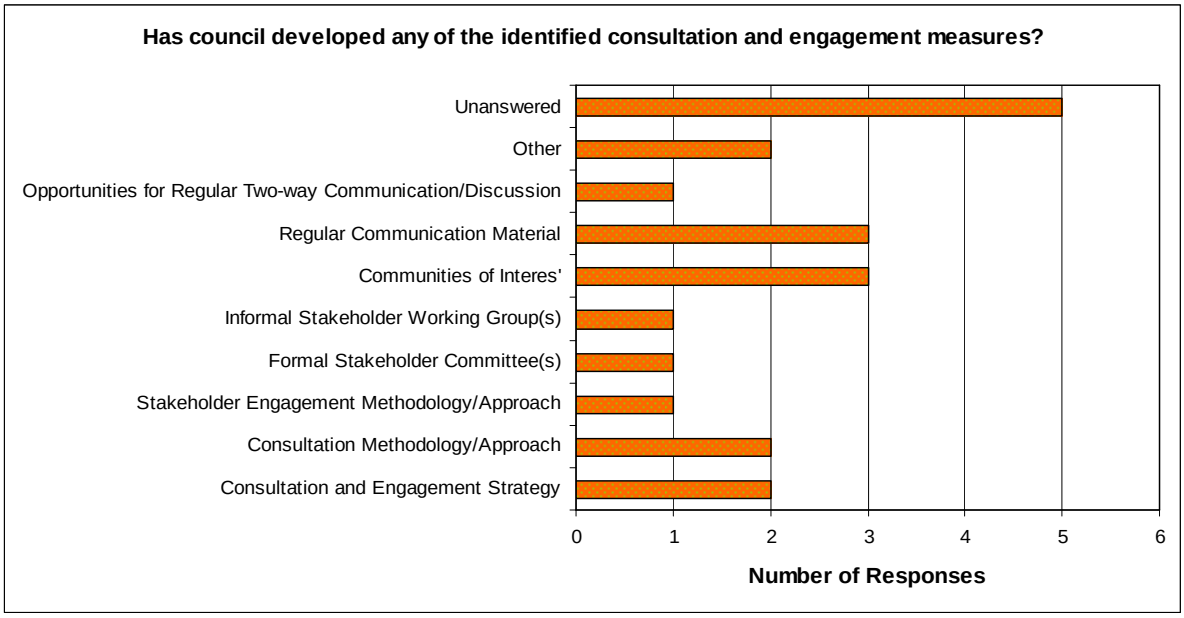
Summary of outcomes

Of the eight respondents, three had developed consultation and engagement measures.

One had all listed measures in place.

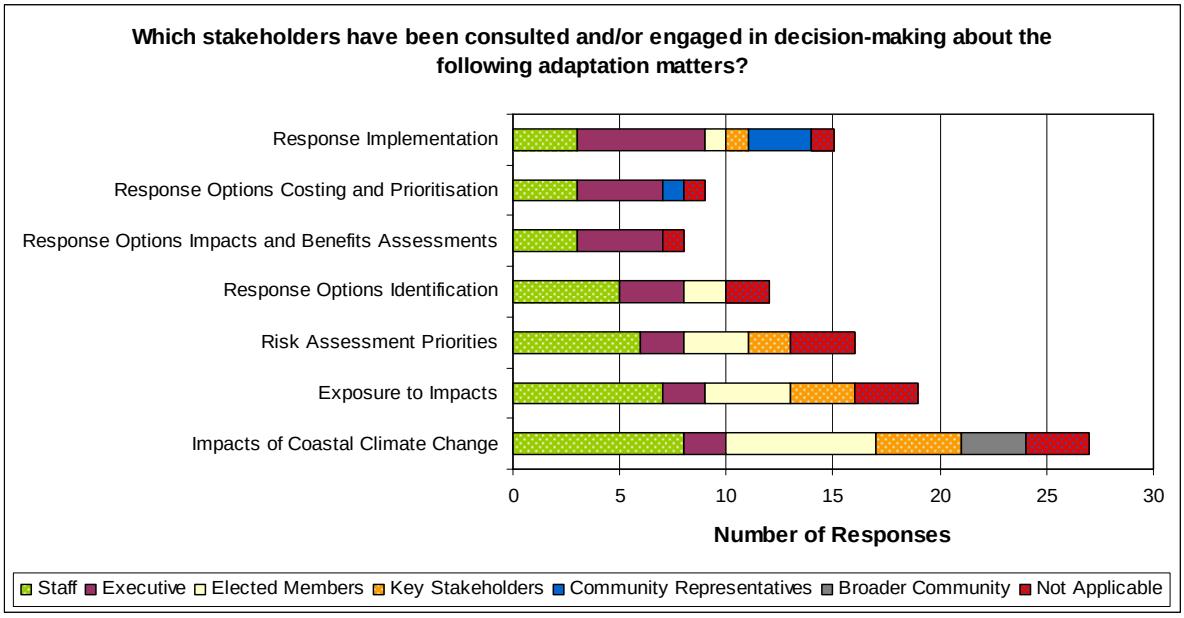
Two had developed a strategy and methodology.

All three had regular communication material and communities of interest established.



Most respondents heavily involved staff and their executive in adaptation decision making, with elected members most involved in climate change impacts, exposure to impacts, risk assessment priorities and response options identification.

The community is being consulted and engaged predominantly at the response prioritisation and implementation end of decision making.



The top three adaptation consultation and engagement needs were cited as:

- Consultation and engagement methodologies (10 of 10);
- In-house skills and expertise (7);
- Funding and resource capacity (5).

Conclusions

1. Most respondents either have not commenced or are at the early commencement stages of their community consultation and engagement for climate change adaptation.
2. Results indicate higher levels of engagement within the organisations than externally.
3. There is a clear need to negotiate at the State level for the provision of methodologies, technical information and guidelines to improve in-house knowledge and skills within councils.
4. In addition to the above and increasing resourcing, there are opportunities to increase external consultation by building staff and elected member confidence in the quality of data analysis, various adaptation response options and relevant cost benefits.

SECTION 5: Corporate and community integration of coastal climate change adaptation

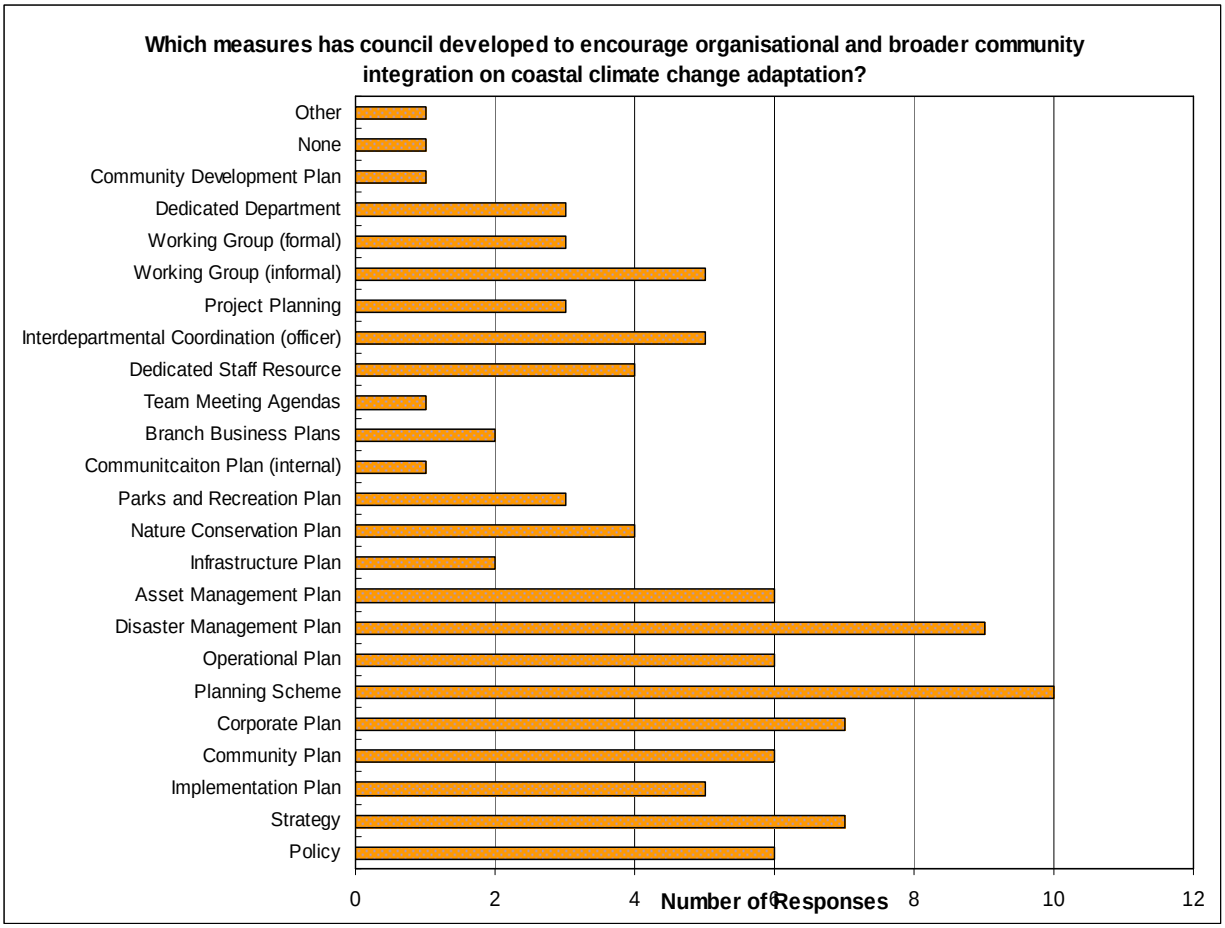
Summary of outcomes

The most commonly developed measure to encourage organisational and broader community integration of coastal climate change adaptation are the local government planning scheme (10 out of 12) and the disaster management plan (9).

Seven respondents have prepared a strategy and included climate change adaptation into their Corporate Plans.

Half of the respondents had included climate change adaptation into asset management, operational and community plans.

Five respondents have a nominated interdepartmental coordination officer and three have a dedicated department.



Conclusions

1. The results indicate a trend of integrating climate change adaptation into statutory documents first, followed by organisational planning documents, although the overall numbers are still reasonably low.
2. There are opportunities for councils to share information on how they have incorporated climate change adaptation within statutory and organisational documents.
3. There are opportunities to increase integration levels by building staff and elected member capabilities and confidence in the quality of data analysis, adaptation responses and council's decision making capability.

SECTION 6: Measurement and reporting

Summary of outcomes

Three of twelve respondents have developed a measurement and reporting framework to measure and report on the progress of their adaptation agenda.

Respondents cited the following as their top three needs in this area:

- Methodologies for selecting appropriate measurement options;
- Resourcing and capacity; and
- Establishment of a baseline.

Conclusions

1. Generally, respondents are not yet ready to tackle this element of climate change adaptation.
2. There are opportunities for the early adoption of methodologies for measurement and reporting

that are consistent at a state and national scale.

3. Levels of participation in the development of monitoring and reporting will increase with improvements in data and capabilities discussed in earlier sections of this report.

Attachment

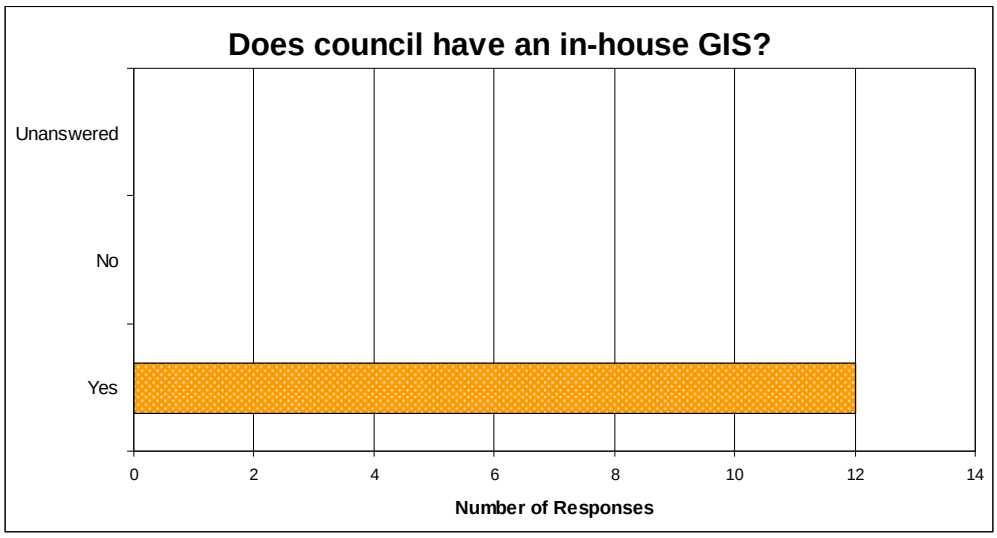
1: Coastal Councils Adaptation Activities Survey Results

Attachment 2: Survey Results

SECTION 1: DATA ACCESS, ANALYSIS AND COMMUNICATION

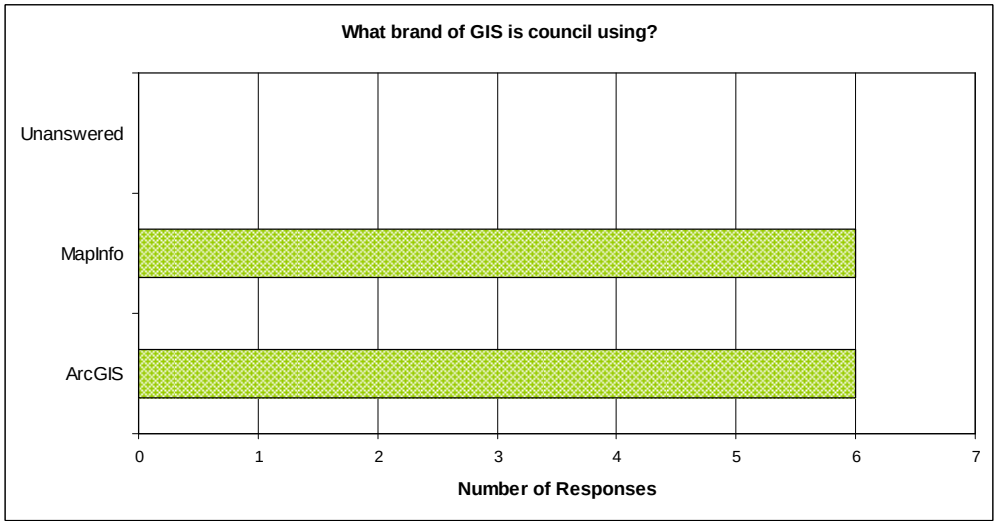
Q 1a) Does Council have an in-house GIS?

Number of respondents: 13



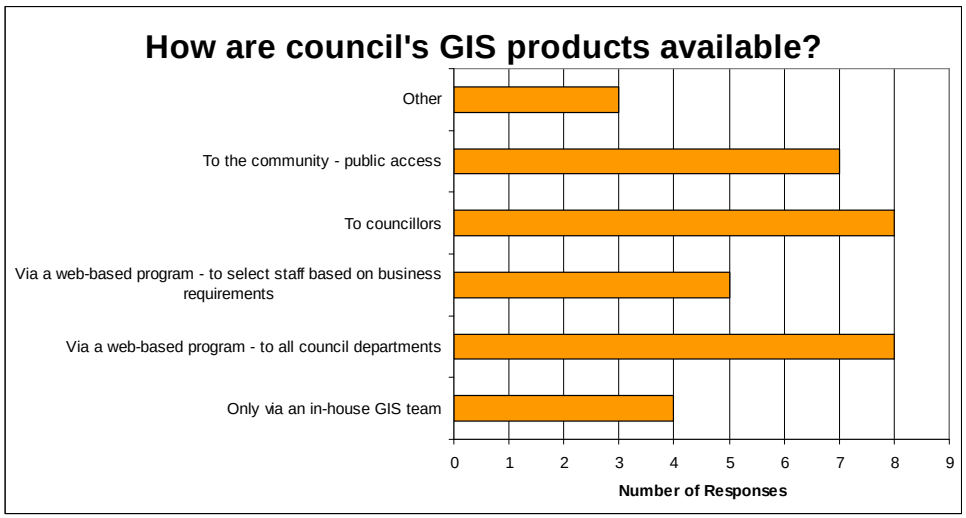
Q 1b) What brand of GIS is council using?

Number of respondents: 12



Q 2 How are council's GIS products available?

Number of respondents: 11



Q 3 What data does your council currently have?

Number of respondents: 12

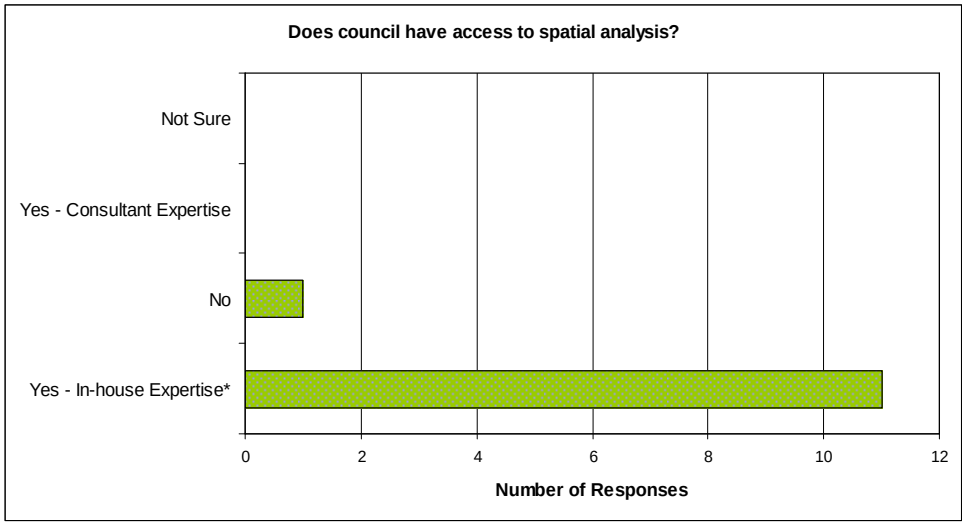
Council	Response
1.	Storm surge DERM Storm Surge Natural assets Infrastructure and assets
2.	Storm surge mapping (2005) with 0.5m sea level rise Flooding for Barron delta Infrastructure mapping Asset mapping Open areas and reserves Working on Natural Asset mapping and Biodiversity mapping
3.	Storm Surge Modelling Natural Asset Mapping Digital Elevation Model, Flood Modelling Infrastructure & Asset Mapping
4.	Storm Surge Modelling Natural Asset Mapping Infrastructure and Asset Mapping

Council	Response
5.	Sea Level Rise And Storm Tide Whole Of City Hydraulic Models Whole Of City Elevation Models For Terrestrial And Waterways Flood Spectral Water Circulation Whole Of City Lidar Whole Of City (In Progress) Contours Catchments Waterways Flora And Fauna Threatened Species
6.	Storm Tide Hazard (bath tub approach) Storm Tide Risk Assessment Sea Level Rise (0.1m increments between 0 mAHD and 2.5m AHD) Riverine and Storm Tide concurrent flooding (under development) High Resolution Digitial Elevation Model and elevation contours based on LiDAR
7.	Storm Surge Modelling, Natural Asset Mapping (Fauna, Flora, Tree Register, Ecological Corridor), Invasive Species Red Imported Fire Ants, Yellow Crazy Ants Infrastructure Mapping Asset Mapping Risk mapping (Acid Sulfate Soil , Bushfire, Contaminated Land, Flood, Sea level rise, Storm surge, Landslip Risk) Community Group coverage Heritage - Local Area Local Law - Vegetation High Water Mark (MHWS) Tenure Watercourse Hold all published State Mapping sets for the above
8.	Storm Surge Natural Asset Mapping Infrastructure Mapping Asset Mapping
9.	Storm Surge Natural Asset Mapping Infrastructure Mapping Asset Mapping Coastal inundation mapping,

Council	Response
	Land use layers Tenure
10.	NIL
11.	Storm Tide modelling mapped, Flood modelling mapped, natural assets mapped (high ecologcal values waterways, GBR wetlands, some species distribution), Infrastructure and asset mapped, bush fire hazards mappped, landslip hazards mapped, storm tide evacuation zones mapped, disaster management layers mapped (evac centres, evac routes, demograpohics, emergency management centres)
12.	Storm Surge Modelling Natural Asset Mapping Infrastructure Mapping Asset Mapping

Q 4 Does council have access to spatial analysis?

Number of respondents: 12



Comments:

Council	Response
1.	GIS Specialists
2.	Ability to use GIS programs, develop layers, integrate layers
3.	No specific expertise
4.	No response provided
5.	Council has in-house expertise within a dedicated GIS team.

Council	Response
	External consultants do get hired from time to time on an as needs basis. Waterways and flood management team have an embedded dedicated GIS technical expert.
6.	ArcGIS Extensions 3D Analyst and Spatial Analyst
7.	Expertise covers analysis of spatial database in many areas of Council business, planning and operations, including current activity in: - Development planning and control; - Climate change impact analysis on assets; - people and environment; - Sea level; and - storm surge analysis.
8.	Council's GIS has the licensing and ability to run tasks using ESRI extensions Spatial Analyst and 3D Analyst, Larger tasks are outsourced to consultants due to computing power.
9.	Considerable expertise in spatial analysis. For example, recently created an entire waterway network using DEM and hydrological modelling software. The latest DEM was derived from a 2008 laser survey of the region (resolution ~1m).
10.	Nil
11.	Spatial, 3D, and Network
12.	GIS Officer and limited Technical Officers

Q 5 Please list your council's top 3 coastal climate change adaptation data and mapping priorities?

Number of respondents: 10

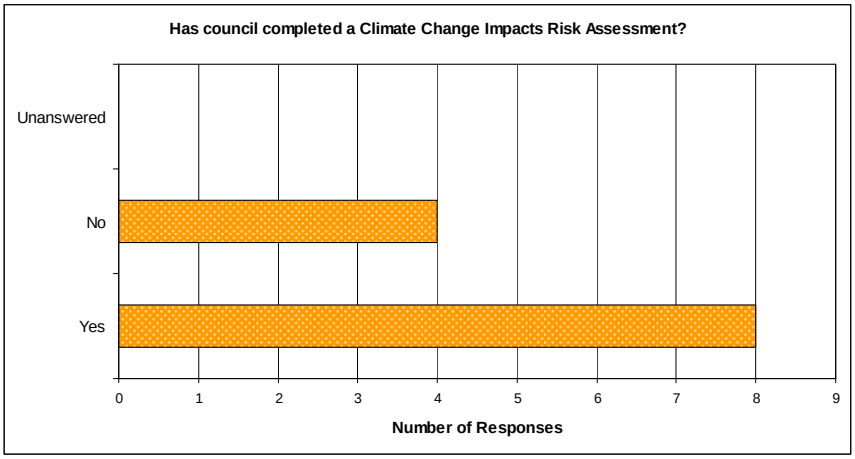
Council	Response
1.	1. Storm tide and inundation mapping 2. Erosion Projections 3. Vulnerability Mapping: Social demographic; Disaster Centres etc.
2.	1. Additional flooding mapping 2. Integrated mapping for flooding and storm tide (i.e. severe rain event + storm surge) 3. Climate hazard mapping
3.	1. Obtaining the coastal hazard mapping under the Coastal Plan 2. Assessing the vulnerability of natural assets and the ability for them to retreat - impacts on vegetation communities 3. Assessing the value of natural assets in protecting built assets from the impacts of storm surge.
4.	No response provided
5.	1. Overland flow path 2. Revetment/seawall 3. Asset vulnerability

Council	Response
6.	1. Mapping of existing coastal defences 2. Mapping of areas at high risk of erosion under future Sea Level Rise scenario 3. Mapping of density of public and private infrastructure along coast (in order to identify areas to defend or retreat from)
7.	1. Compare recently acquired storm surge and sea level rise spatial data (modelling) to Councils various asset spatial data (stormwater, roads, marine access, sewage infrastructure, foreshore structures and buildings 2. Compare recently acquired storm surge and sea level rise spatial data (modelling) to natural assets, areas and habitats (some species as well), and open space. 3. Complete the necessary two dimensional storm surge studies on foreshore areas (3 areas complete, four remaining).
8.	1. Vulnerability analysis 2. Inundation mapping 3. Hazard and risk mapping/analysis
9.	1. Consistent flood modelling for the region 2. Consistent, more detailed coastal inundation mapping 3. Data on social and economic values associated with coastal assets
10.	No response provided
11.	1. Storm tide modelling with QCP position on climate change 2. At risk assets/infrastructure/properties/natural assets 3. Ongoing LiDAR for coastal erosion assessment
12.	1. Model flooding and storm surge together 2. Improved flood modelling 3. Hazard mapping

SECTION 2: RISK ASSESSMENT AND PRIORITISATION

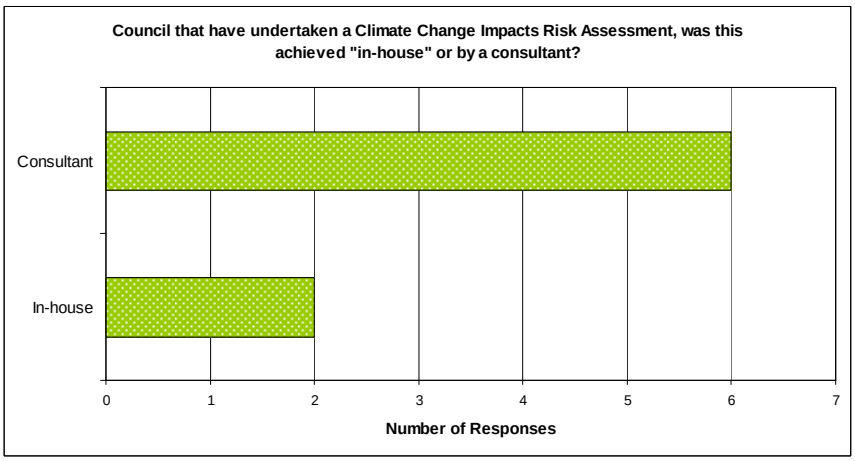
Q 6a) Has council completed a Climate Change Impacts Risk Assessment?

Number of respondents: 12



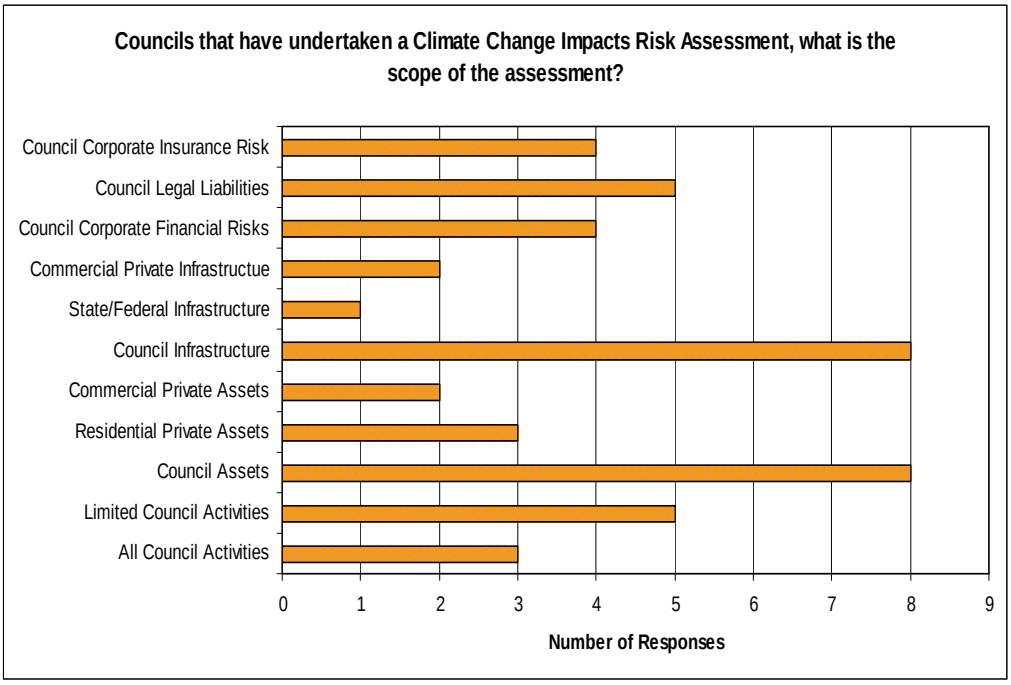
Q 6b) If yes, was the risk assessment done in-house or by a consultant?

Number of respondents: 8



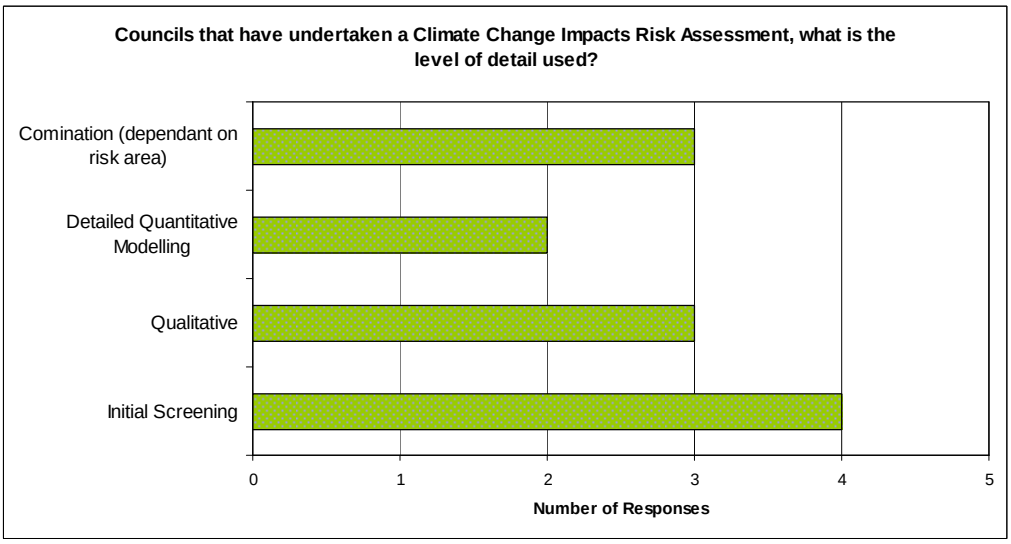
Q 6c) If yes, what is the scope of the assessment?

Number of respondents: 8



Q 6d) If yes, what is the level of detail used?

Number of respondents: 8

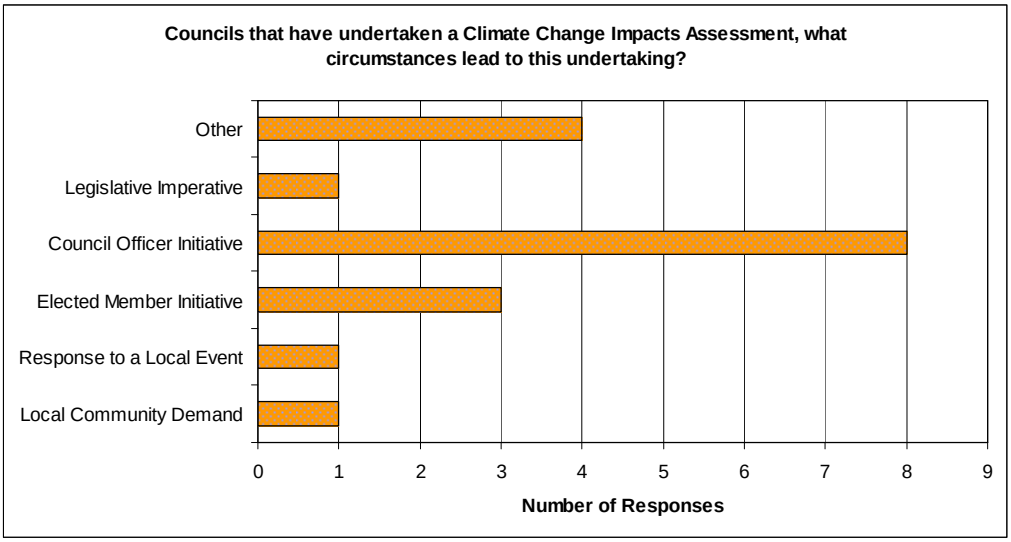


Council	What is the level of detail used? - If a combination, please provide details
1.	Screening for business continuity Qualitative corporate insurance Quantitative asset vulnerability Quantitative shoreline management
2.	Started with the LGAQ/ LAPP approach through LAPP funding two years ago and have gone into greater detail and assessment through the development of

Council	What is the level of detail used? - If a combination, please provide details
	Council's Climate Change Strategy. This involved Marsden Jacobs Associates, and Cardno P/L as consultants doing modelling. Council has since just commenced more detailed analysis of some risks.
3.	Have used available land use mapping. Trying to quantify exposure for coastal hazards (e.g. erosion, SLR, inundation by storm surge) as well as extreme temperature and rainfall.

Q 6e) If yes, what circumstances lead to this undertaking?

Number of respondents: 8 (multiple answers selected)



Q 7 What are your council's top 3 coastal climate change risk assessment and prioritisation needs?

Number of respondents: 10

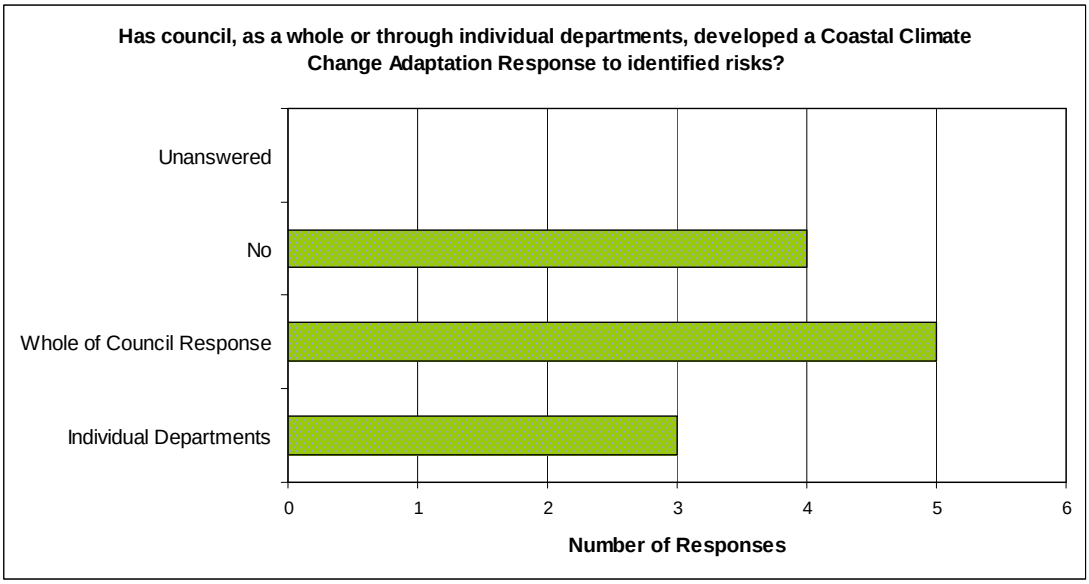
Council	Response
4.	1. Stakeholder engagement and communications 2. Regional Infrastructure
5.	1. Organisation prioritisation 2. Project funding (competing budget) 3. Coordinated effort to implement across organisation
6.	1. In-house knowledge & expertise 2. Development of a consistent approach to the issue across Council 3. Development of a Council policy in relation to the issue.
7.	No response provided
8.	1. Data access and downscaling 2. Community engagement and communications 3. Liability of decision making 4. Legislative certainty 5. Consistent methodology

Council	Response
9.	1. Organisational prioritisation 2. In-house knowledge and expertise 3. Improved communication with community
10.	1. Funding to cover the mapping and analysis work needed at the local level 2. State assistance with mapping methodologies and regional coordination of approach 3. State legislative backing for introducing planning and development changes so that Councils are not held liable for action
11.	1. Reliable base data/mapping 2. Organisational prioritisation 3. Project funding
12.	1. Clarification of roles/responsibilities of 3 levels of government 2. For the State/Federal Government to provide an agreed framework for cc adaptation decision making 3. Resources/funding to address the issues
13.	1. In house knowledge and expertise
14.	2. Consistent methodologies 3. In-house knowledge and expertise 4. Organisational prioritisation
15.	No response provided

SECTION 3: DEVELOPING COASTAL CLIMATE CHANGE ADAPTATION RESPONSES

Q 8a) Has your council or individual department developed/is developing coastal climate change adaptation responses to the risks identified?

Number of respondents: 12



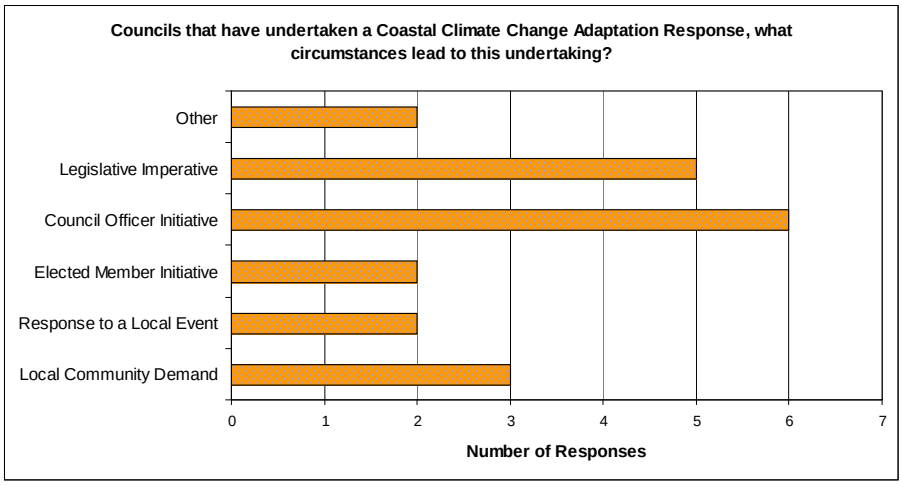
Council	Response
1.	Yes - individual departments
2.	Yes - as a whole of council response
3.	No
4.	No
5.	Yes - as a whole of council response
6.	No
7.	Yes - as a whole of council response
8.	Yes - individual departments
9.	Yes - as a whole of council response
10.	No
11.	Yes - as a whole of council response
12.	Yes - individual departments

If "yes - individual departments": Please list which council departments

Council	Response
1.	Some adaption eg. design building levels, internal conceptual planning
2.	Infrastructure and Planning
3.	Developing a Climate Change Policy Planning decisions are governed by Coastal Management Plan and Regional Plan and will be reflected in new WRC Planning Scheme

Q 8b) If yes, what circumstances lead to council undertaking this activity?

Number of respondents: 8



If 'other':

Council	Response
1.	Endorsed action under SCC's Climate Change and Peak Oil Strategy
2.	Funding through Local Adaptation Pathways Program

Q 8c) Where applicable, please list the activities your council has undertaken or has identified for implementation

Information for council or community

Number of respondents: 7

Council	Response
1.	Climate change and energy strategy on web.
2.	Demonstrate good governance by informing the general community about climate change and peak oil impacts and risks (web, community plan info, sustainable living expo). Make technical information available to the public regarding climate change risks Monitor the latest climate change science and international best practice standards for addressing climate change and peak oil and update Council's response accordingly Develop staff learning opportunities that will equip staff to identify and respond to climate change and peak oil risks (corporate staff induction and workshops) Conduct a community greenhouse gas emissions inventory and establish a clear methodology for future monitoring to ensure continuity Draft a community emissions reduction plan in consultation with the community, including an emissions forecast, target and trajectory Develop and deliver an education program to raise awareness of peak oil and encourage behaviour change for increased community and industry resilience Promote and support community garden initiatives and plan for urban agriculture to localise food supply Implement a grant program to encourage initiatives that promote sustainability and enhance community resilience to climate change or peak oil
3.	Revetment wall Beach and catchment health Sea level rise, Storm tide 7 riverine flood maps
4.	Develop and implement a Communication, Engagement and Action Plan to provide forums where climate change impacts may be identified and discussed with a view to how community resilience to these impacts may be strengthened. Continue health promotion campaigns in association with Queensland Health (in relation to anxiety about climate change particularly elderly and heat stress).
5.	General information for community and business available from council's strategy and associated background documents.
6.	Still developing strategy. Risk assessment and adaptation plan is information for Council.
7.	Local Area Coastal Erosion Investigation and Mitigation Plan Storm and Flood Mapping

Updating/Developing Guidelines

Number of respondents: 6

Council	Response
1.	Implementation advice: risk assessment framework for implementing coastal plan (internal document only)
2.	Undertake climate change hazard and vulnerability mapping to identify major risk areas Incorporate climate change projections into all hydrological mapping Develop planning approaches to manage potential conflicts in relation to competing land use demands for energy production, food production, open space, nature conservation, carbon sequestration and urban development Protect and enhance strategic wildlife corridors and riparian corridors to allow for species migration
3.	Water sensitive urban design Flood proof housing Asset maintenance planning
4.	Review corporate guidelines and procedures for the management of Lyngbya algal blooms to increase the scope of target area and include NSI and SMBI (including monitoring and response to Lyngbya blooms).
5.	Taking heed of updates to engineering guidelines, etc.
6.	Still developing strategy.

Updating/developing procedures and processes

Number of respondents: 6

Council	Response
1.	Included climate change as a risk category Corporate risk profile
2.	Integrate Sustainability Scorecard tools into Council's procurement and decision-making frameworks Provide an annual progress report to Council on Strategy implementation Implement an Energy and Emissions Data Management System for Council A Draft Sustainable Building Design Policy, Guidelines and Checklist has been adopted by Council Develop and implement Energy Management Plans for all Council buildings and facilities Incorporate climate change adaptation into disaster planning Implement the Climate Change Adaptation Action Plan
3.	Climate change impact statements Flood database Asset management Adaptation strategy for coastal hazards Post storm recovery planning
4.	Investigate options to ensure shelter is available for island communities

Council	Response
	stranded on mainland and/or islands during severe weather events and amend Disaster Management Plan. Undertake further site specific two dimensional modelling of specific areas to refine the storm tide extents, duration of inundation and hazard levels. Complete Rural Futures Strategy incorporating known impacts of climate change on farming options in the council area. Investigate planning options (including amendment of council's Planning Scheme by 2012) to reduce the impacts of sea level rise on future development and incorporate the results of recent storm tide modelling and State Government sea level rise planning requirements in the Coastal Plan. Investigate planning options (including council's Planning Scheme mechanisms) that reduce the impacts of sea level rise on existing development exposed to inundation risks. Re-run catchment flood mitigation hydrologic models to incorporate increase in sea levels due to climate change. Investigate options to ensure Council retains and attracts experienced staff (e.g. flexible hours, work from home and transport options). Identify extent of public open space (sport and recreation areas, parks, and reserves) vulnerable to climate change impacts (in particular to inundation by storm tide, flooding and sea level rise). Investigate land acquisition policy options for replacement these areas based on time-frames in which they may be lost to sea level rise and inundation. Complete storm tide hazard, sea level rise, flooding and inundation mapping of areas of the city not currently mapped. Undertake modelling of storm tides to determine impact of climate change on sea walls and marine infrastructure. Conduct wave-run up modelling of the coastline to inform Council and emergency management of potential inundation risks for a given storm event. Increase on-the-ground resources to control weeds, woody vegetation and fuel hazard reduction (with QFRS) on Council lands. Complete the registering of existing stormwater infrastructure on the asset register. Ensure Acid Sulphate soils criteria are incorporated into IEMS/EMP procedures and PEAT (preliminary environmental assessment tool) and updated. Update the stormwater asset register to include soft infrastructure (e.g. wetlands).
5.	Commenced development of a Shoreline Erosion Management Plan.
6.	Still developing strategy. Development of Shoreline and Erosion Management Plans for two bays.

Amending statutory plans, policies and regulations

Number of respondents: 7

Council	Response
1.	City plan review development levels neighbourhood plans
2.	Integrate relevant visions and objectives from the Community Plan into this Strategy during annual review. Integrate climate change and peak oil considerations into Council's Corporate Plan Ensure climate change and peak oil considerations are included in Council's policies and strategies Integrate climate change and peak oil considerations into Council reports by implementing the Sustainability Scorecard
3.	Boulder/sea wall local law Planning scheme review building setback code Waterfront set back code Waterways and wetland code
4.	Review and update Bushfire Management Plans and Bushfire Hazard Risk Mapping every 5 years. Ensure that the Disaster Management Plan is reviewed and amended to meet the longer term demands for emergency services arising from climate change. Amend building codes to reflect design changes for future new buildings in response to changing climate and ensure they incorporate energy transition in the design, are resilient to oil vulnerability, have sustainable energy and transport options. Ensure that open space facilities incorporate cutting edge design and products to maximise their resilience to climate change impacts. Obtain and correlate spatial data on open space buffers and storm tides, flooding and coastal inundation with data on bushfire and regional ecosystems. Review Open Space Strategy to include impacts from a changing climate. Promote local employment opportunities to minimize the need for extended travel by residents for commuting purposes. 'Green Living' performance indicators for the Community Plan 2030 and Council Corporate Plan are used to indicate Council's performance on climate change, and this strategy.
5.	Planning Scheme is developed with climate change adaptation measures.
6.	New Planning Scheme under development will address climate change in a manner consistent with the new Queensland Coastal Plan and associated State Planning Policy.
7.	Still developing strategy and currently developing new city planning scheme

Retrofitting existing assets

Number of respondents: 4

Council	Response
1.	Develop a Carbon Neutral Accounting Plan to set an emissions trajectory to achieve Council's emissions reduction goal Generate 20% of Council's electricity requirement from on-site renewable energy systems by 2020 Continue to improve energy efficiency in Council buildings and encourage behaviour change among staff Conduct energy audits for Council-owned swimming pools and implement Energy Management Plans and Agreements with lessees as part of an overall Quality Assurance Program. Implement the Water Demand Management Strategy Implement the Waste Management Strategy and associated Action Plans Incorporate the consideration of climate change impacts into Council's land use planning and development assessment activities Embed climate change and peak oil considerations into the Planning Scheme
2.	Review Council's buildings without generators (or access points for a mobile generator).
3.	Still developing strategy
4.	Improved energy efficiency of buildings.

Diversifying - spreading the risk

Number of respondents: 4

Council	Response
1.	CSIRO partner project on financial costs for coastal inundation - looking at an empirical assessment of physical and institutional climate adaptation pathways.
2.	Early discussion with insurance industry regarding improved access to flood insurance
3.	Advocate for more effective state and federal programs that assist the community in living more sustainably, including participating in inquiries and call for submissions on major government initiatives. Advocate for the state government and other councils to take regional approach to researching climate change impacts on animal or plant populations, habitat or ecosystems through persistent water stress. Advocate for the state government to assume a greater role and responsibility for algal bloom management, with commensurate increase in resources. Advocate for the state government and other councils to take regional approach to researching climate change impacts on Acid Sulphate soils and animal or plant populations, habitat or ecosystems. Advocate and gain clear direction from State Government on planning responses to sea level rise, public and environmental health issues arising from climate changes, including improving planning scheme capacity for continual updating. Advocate the State Government regarding enabling legislation to provide

Council	Response
	Council with the mechanisms for land resumption or compensation in response to sea level rise predictions. Conduct / renew dialogue with the DERM, and other relevant State Agencies and other affected Councils regarding enforcement of Coastal Building Lines, especially at Amity Point. Advocate for greater regional risk assessment, coordination, and common policy and planning controls in response to climate change.
4.	Still developing strategy

Staged retreat

Number of respondents: 3

Council	Response
1.	Shoreline Erosion Management plan - currently focuses on the major urban area and looks at adaptation options for coastal areas - these take into account retreat, relocation, defend or do nothing. Looking to expand this Plan to region. Part of Planning Scheme review
2.	Conduct/renew dialogue with DERM and other relevant State Agencies and other affected Councils regarding enforcement of Coastal Building Lines, especially at one of the island settlements.
3.	Still developing strategy

Relocation - staged or otherwise

Number of respondents: 3

Council	Response
1.	Shoreline Erosion Management plan - currently focuses on the major urban area and looks at adaptation options for coastal areas - these take into account retreat, relocation, defend or do nothing. Looking to expand this Plan to region. Part of Planning Scheme review
2.	Still developing strategy

Defend and protect

Number of respondents: 3

Council	Response
1.	Shoreline Erosion Management plan - currently focuses on Cairns area and looks at adaptation options for coastal areas - these take into account retreat, relocation, defend or do nothing. Looking to expand this Plan to region. Part of Planning Scheme review There are sea walls at two main beaches
2.	Revetment and sea wall local law Beach nourishment Riparian restoration

Council	Response
	dune restoration Hard engineering solutions Formal climate change planning
3.	Still developing strategy. Coastal erosion protection measures and trials at three coastal locations in local government area.

Other

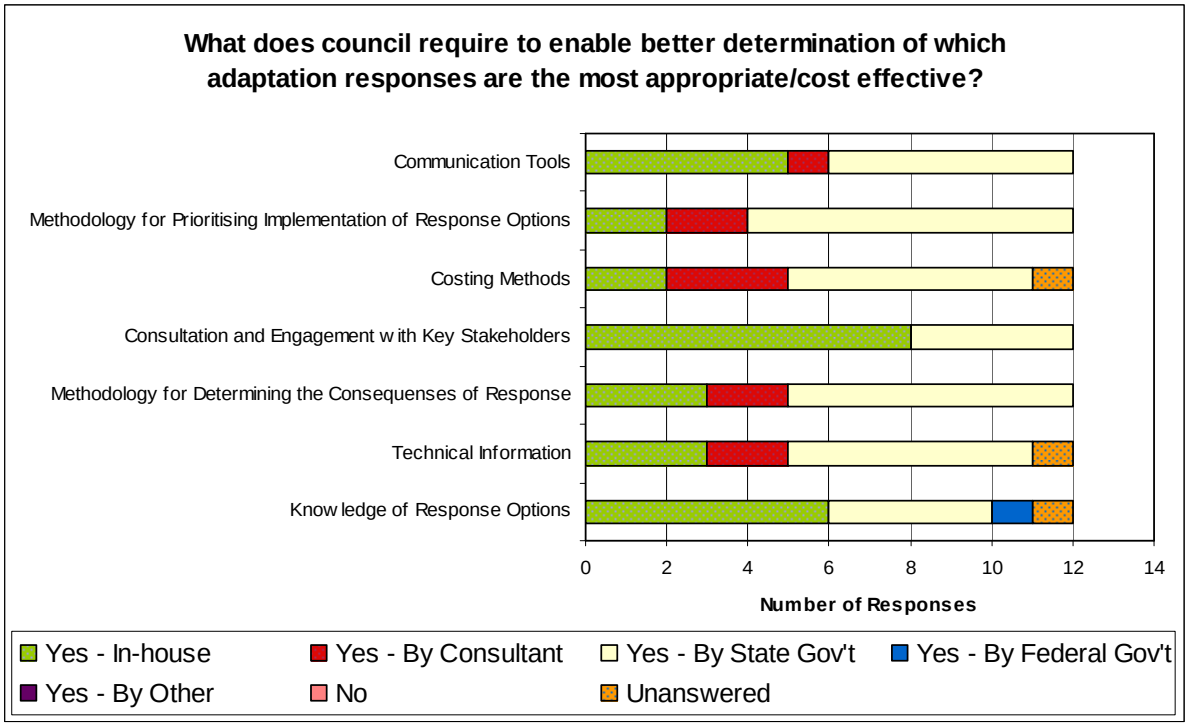
Number of respondents: 1

Council	Response
1.	Incorporate climate change risks and treatments into all current and future Council ERA licenses and all sites registered on Council's Integrated Environmental Management System for which Environmental Management Plans apply.

Q 9a) Which of the below options does your council currently require to enable it to better determine the most appropriate/cost effective adaptation responses?

How would you prefer to access them?

Number of respondents: 12



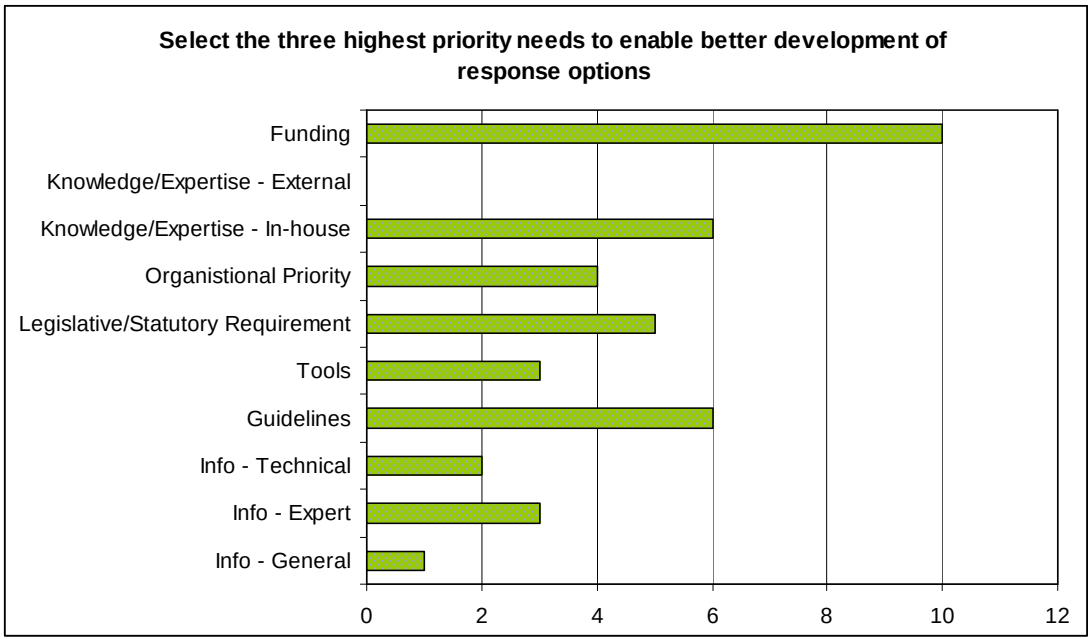
Other (please specify)

Council	Response
1.	Mixed form of delivery Delivery across all levels of government
2.	State government complete cost benefit analysis of options Exemption for local governments to make decisions based on best available

Council	Response
	information Remove injurious affection opportunities for decreased development rights due to climate change impacts and decision making
3.	COMMENT - We would have liked to tick multiple boxes for several of the above. Given we could only choose one, we've indicated first priority.
4.	Council would benefit from any access to information regarding appropriate and cost effective adaptation responses.

Q 9b) For each of the response option areas listed, select the three highest priority needs that would enable your council to better develop response options?

Number of respondents: 12



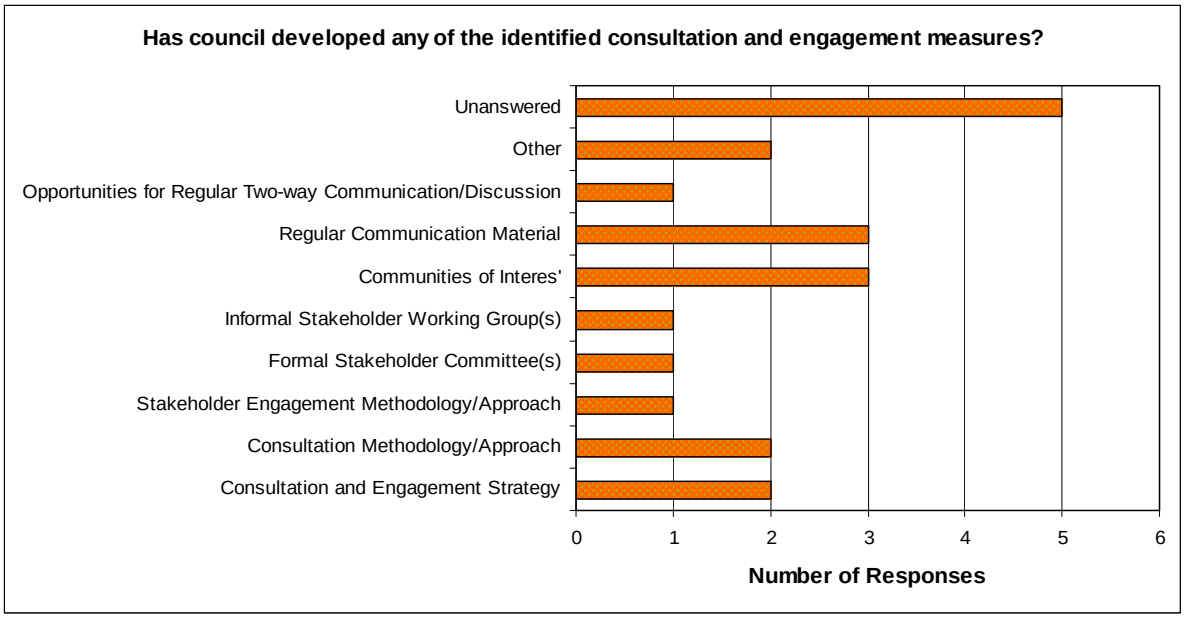
Other (Please specify)

Council	Response
1.	Better staff retention, advice on appropriate qualifications for consultants, expertise within State government.
2.	We are assuming that the statutory requirement under the new Qld Coastal Plan means that the Legislative/statutory requirement is mandatory.

SECTION 4: COMMUNITY ENGAGEMENT AND CONSULTATION

Q 10 Has council developed or is developing any of the following consultation and engagement measures?

Number of respondents: 8

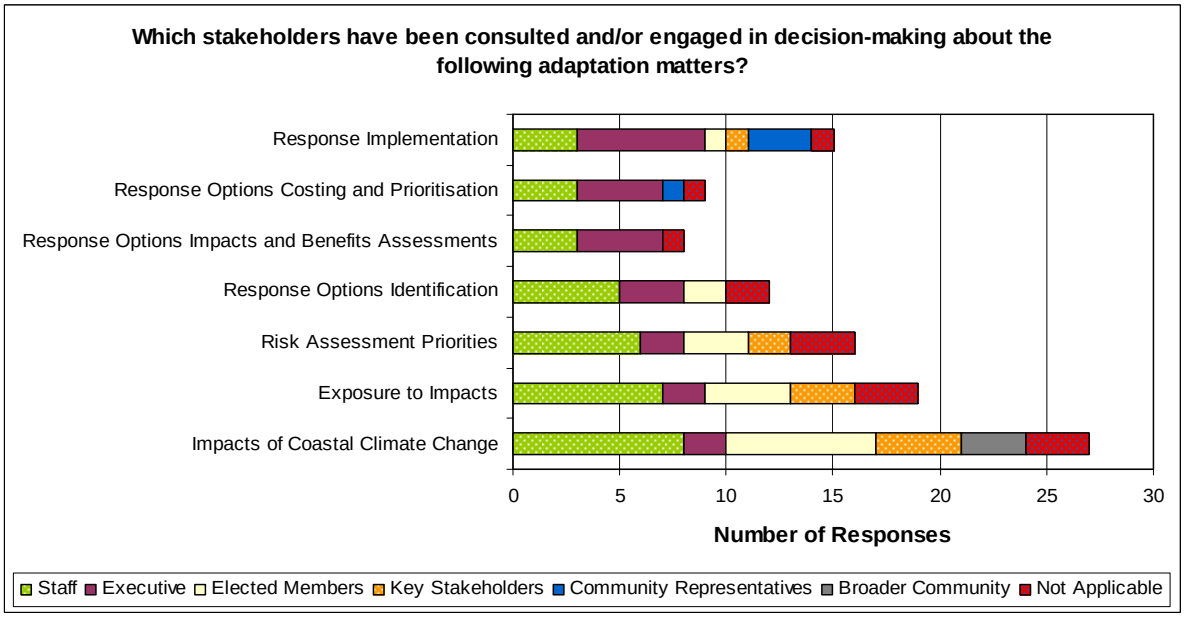


Other (Please specify)

Council	Response
1.	No
2.	No. In-house communication only at this stage.

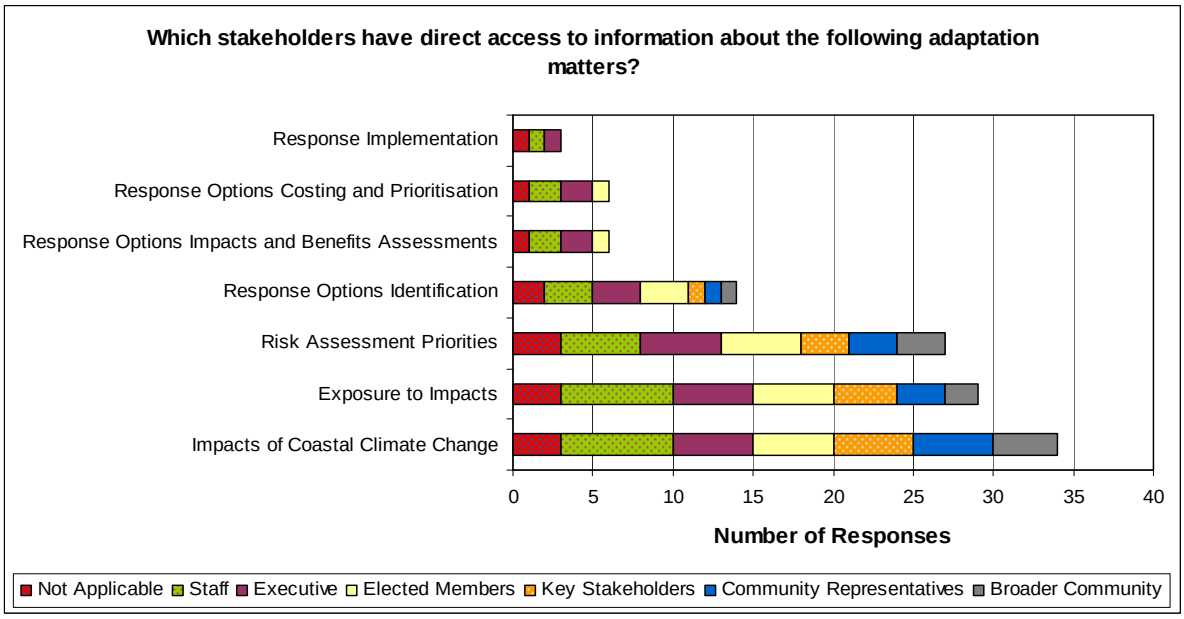
Q 11 Which stakeholders have been consulted/and or engaged in decision-making about adaptation?

Number of respondents: 10



Q 12 Which stakeholders have direct access to information about the following adaptation matters?

Number of respondents: 8



Q 13 Please list the top three coastal climate change adaptation consultation and engagement needs.

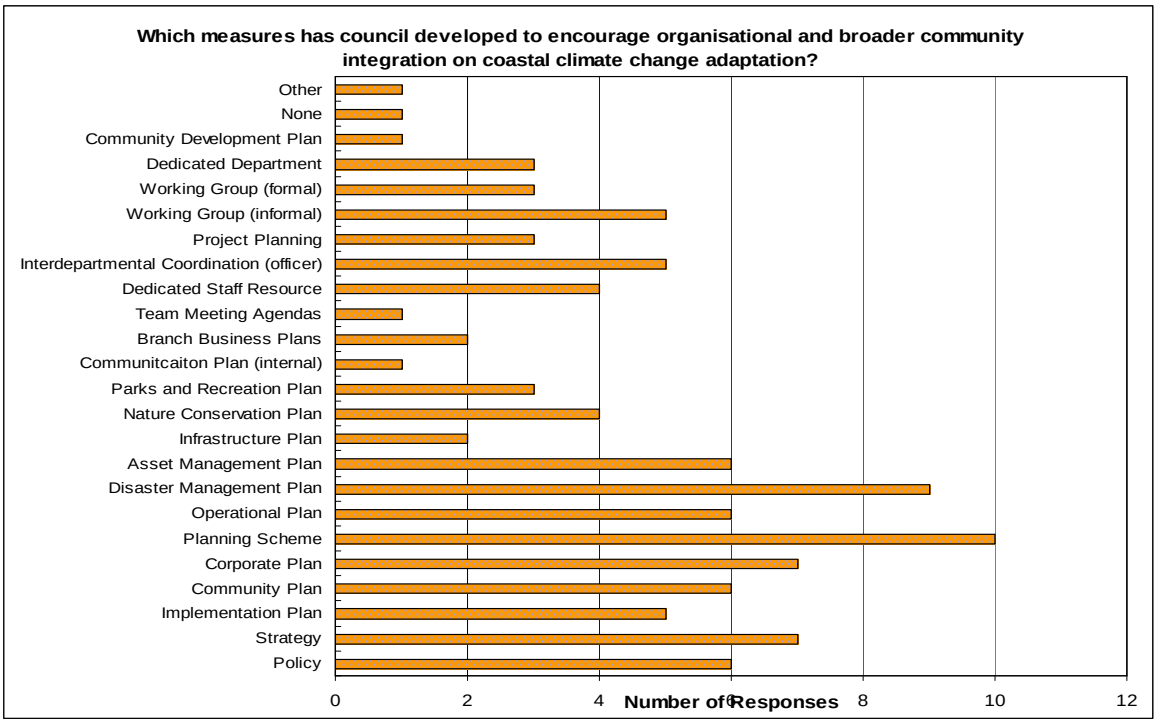
Number of respondents: 10

Council	Response
1.	1. Stakeholder engagement approach 2. In-house skills 3. In-house capacity
2.	1. Funding for project 2. Internal resource capacity 3. Methodology
3.	1. Resourcing 2. Improved in-house expertise 3. Development of a Council policy 4. Development of a consistent approach across Council
4.	No response provided
5.	1. Organisational priority 2. Effective communication between state, councils, research institutions and coastal management groups 3. Investment
6.	1. Public engagement program co-ordinated at state level with generic terminology and education materials (able to be customised for local conditions) 2. Appropriately trained staff 3. Legislated imperative

Council	Response
7.	1. More time and resources to complete a step wise process that has commenced 2. Greater understanding in more detail about the impacts the local level /suburb level 3. Achieving community agreement and investment to support prioritised adaptation options
8.	1. Communities which are genuinely interested 2. In-house capacity 3. Stakeholder engagement methodology
9.	1. A recipe to follow for cc adaptation 2. A framework or template for the provision of cc information 3. Advice/support on the best way to approach the issue/engage with stakeholders
10.	No response provided
11.	1. Consistent consultation methodology/approach across state 2. Stakeholder engagement methodology/approach 3. Translation of technical information to everyday language
12.	1. Methodology/ approach 2. Expertise - delivery strategy/method 3. Clear messages - concise delivery of information

Q 14 Which measures has your council developed/or is developing to encourage organisational and broader community integration on coastal climate change adaptation?

Number of respondents: 12



Other (Please specify)

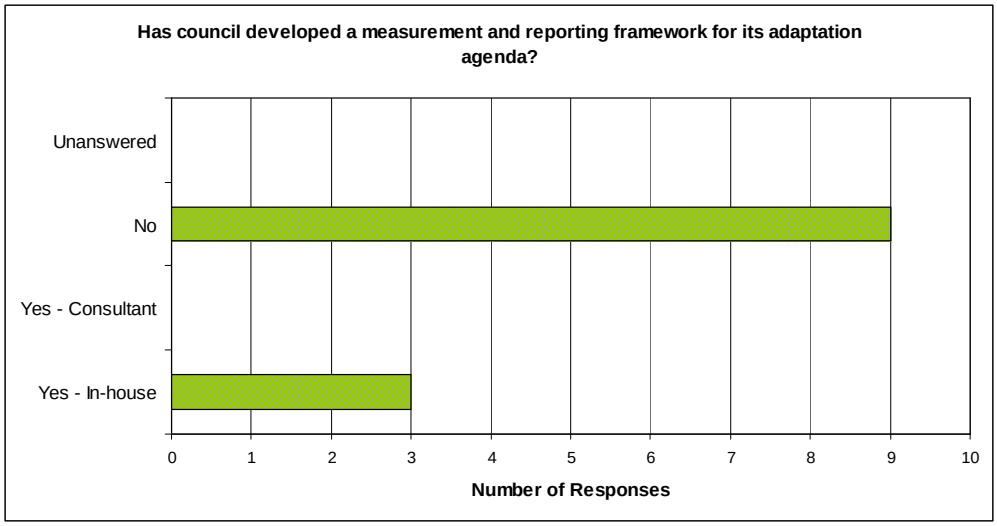
Number of respondents: 1

Council	Response
1.	The little planning implemented mainly goes into flood damage plans and brief coastal research. No major work has begun.

SECTION 5: MEASUREMENT AND REPORTING

Q 15 Has council developed or is currently developing a measurement and reporting framework for its adaptation agenda?

Number of respondents: 12



Q 16 List council's top three measurement and reporting needs

Number of respondents: 12

Council	Response
1.	1. Corporate risk measurement and reporting
2.	2. Capacity/time 3. Methodology for selecting appropriate measurement options 4. Doing vs measuring
3.	1. Resourcing 2. Better in-house expertise 3. Guidance on an appropriate approach
4.	No response provided
5.	1. Establishing a base case 2. Ecological, morphological (coast) governance framework options 3. Consultation and engagement with broader community
6.	1. Appropriately trained staff
7.	1. Overcome critical funding limitations preventing early action on adaptation responses 2. Development of suitable indicators to track adaptation response 3. Wider benchmarking among local government in Qld to understand our

Council	Response
	progress - across the breadth of adaptation responses - against what might be considered 'reasonable' or 'necessary'.
8.	No response provided
9.	1. How do we measure/quantify/determine future risks?
10.	No response provided
11.	1. Knowledge of consistent measurement and reporting framework options 2. Methodology for selecting appropriate and consistent measurement options 3. Tools for consistent measurement
12.	No response provided

Q 17 For the purposes of information sharing and assisting other councils, is your council willing to share products, methodologies or processes with other Queensland councils?

Number of respondents: 12

Council	Response
1.	Yes
2.	Yes
3.	Yes
4.	Yes
5.	Yes
6.	Yes
7.	Yes
8.	Yes
9.	Maybe - please contact to discuss
10.	Yes
11.	Yes
12.	Yes

Q 18 Please list below any products, process, tools, methodologies your council has developed and considers may be best practice

Number of respondents: 7

Council	Response
1.	N/A
2.	Climate Change Adaptation Action Plan Climate Change Strategy GHG Mitigation Action Plan Carbon Emissions Reduction Policy Corporate Sustainability Policy Sustainable Building Design Policy & Checklist Energy and Emissions Data System

Council	Response
	Sustainability Scorecard Biodiversity Strategy
3.	None at this stage
4.	No response provided
5.	Coastal management Coastal survey Ecological and morphological revetment/sea wall asset vulnerability Sea level rise, riverine and storm tide modelling methodology
6.	Regional Floodplain Database - an approach for efficient floodplain mapping across a large area. Contains a number of innovative sub-processes. Project includes climate change scenarios. Storm Tide Management Study - an investigation into available options for managing existing storm tide risk including innovative risk assessment methodology. Technical Report documenting standard approach to incorporating climate change scenarios into riverine flood risk assessments (inc sea level rise, storm tide, rainfall intensity)
7.	All documents are web based and can be linked to LGAQ toolbox
8.	No response provided
9.	Climate Change and Peak Oil Strategy
10.	No response provided
11.	Flood Modelling, Storm Tide Modelling, Pilot Project with DERM/LGAQ Storm Tide Evacuation Zones in accordance QLD disaster evacuation guidelines
12.	No response provided