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Planning for coastal change adaptation in Scotland

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1 Executive Summary

1.1 Aims

Areas of the Scottish coast are highly vulnerable to serious erosion and flooding due to climate change. In 2022, the Scottish Government introduced Coastal Change Adaptation (CCA) funding for local authorities (LAs), to help with planning to mitigate the impacts of these hazards on coastal communities.

A total of £6.7 million to date has been released through two funding routes: using a **direct allocation** model, with monies paid directly to a LA and not subject to ringfencing; and through **case study** applications, with monies paid directly to a LA for a specific activity or set of activities as outlined in the application form. A further £5 million in CCA funding will be distributed in 2025-26.

A key intended outcome of the CCA funding is that LAs develop Coastal Change Adaptation Plans (CCAPs).

This report investigates:

- Awareness among surveyed LA practitioners of coastal erosion and sea level rise-associated risks.
- How LAs have used CCA funding both through **direct allocation** and **case study** monies.
- The different barriers to planning for coastal change adaptation that have emerged.

The report is based on a survey, interviews and focus group discussions with LAs. It is not a representative sample of officers across Scottish LAs and the outcomes have not been through a formal review process by COSLA.

The findings and recommendations are an initial step in helping inform future Scottish Government decision-making for financing and supporting coastal change adaptation through LAs.

A note on definitions of climate adaptation:
Climate adaptation – The IPCC defines climate adaptation as, "the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities." (IPCC Glossary, acc. 2024)

The Scottish Government funded Adaptation Scotland programme describes adaptation as "a process of on-going adjustments in response to observed and projected climate change impacts. This includes being prepared for increasing risks posed by climate change hazards, and identifying new opportunities our changing climate may bring, while considering how impacts may be felt differently across society."

The above definitions indicate that adaptation is a process that can involve multiple activities and actors across sectors, levels of government and with impacted communities. Risk assessments, awareness raising, monitoring and evaluation, planning, and implementation of nature-based solutions can all be part of this process (see Figure 3).

In the context of coastal climate change adaptation there also exists a spectrum of activity that can be classified as adaptation from physically moving assets to raising public awareness, undertaking risk assessments, and nature-based or non-natural interventions to manage coastal risk. When this report refers to "coastal risk management" it is referring to the monitoring of coastal change, and use of hard and soft engineering infrastructure and/or use of nature-based solutions to alleviate coastal erosion and flood risks. When this report refers to "land-based adaptation" it is referring to transformative, proactive planning and actions on land that minimise exposure and vulnerability to coastal change hazards, such as making space for the coast to dynamically adjust (e.g. dunes rolling landwards), avoiding development in places of future risk or the re-location of at-risk assets. There are a number of adaptation activities listed in Figure 2 that illustrate the range of coastal adaptation actions considered in this report.

1.2 Summary of findings and recommendations

Adaptation is a process that can involve multiple activities and actors across sectors, levels of government and with impacted communities. Risk assessments, awareness raising, monitoring and evaluation, planning, and implementation of nature-based solutions can all be part of this process. The Scottish Government's dynamic adaptive pathways approach to coastal change adaptation takes into account this spectrum of activity and offers flexibility in managing future uncertainty at the coast.

The research found that while awareness of climate change-enhanced coastal hazards was high, the progress on spending CCA funds was slow. The majority of participants noted that their LAs were at an early stage of the adaptation planning process.

CCA funds had so far been spent on evidence gathering, the management of ongoing coastal risks, and initial community and stakeholder engagement work. Participants also noted that many future activities were planned to focus specifically on land-based adaptation.

The diversity of governance structures across LAs was found to affect planning for coastal change adaptation, and influenced whether **directly allocated** or **case study** funding routes were more effective.

A number of **enabling factors** were noted by participants as helping with the CCA process, including:

- Existing national data sets on coastal risk and bespoke Scottish Government guidance on CCA and the use of these data sets.
- The role of CCA funds and guidance in supporting the shift from reactive risk management to a planned adaptation approach.
- The capacity for CCA funds to be internally reprofiled in the LA to the next year, allowing more cohesive planning.

Building on these enabling factors Scottish Government could:

- Further enhance Scottish Government-led training, advice and guidance in using relevant data sets.
- Fund a national coastal data programme that gathers and shares data to underpin coastal change, flooding, climate change and development planning work.
- Further enhance funding flexibility in terms of signposting, allocation models, and usage by communities to align better with internal LA governance.

Numerous **barriers to progress** were identified by the participants of the research, including:

- A lack of staff, and expertise, to deliver CCA work.
- Knowledge gaps within LAs and the relative newness of the adaptation pathways approach.
- Internal LA decision-making processes that impact ability to access CCA funds.
- Integrating CCA into already complicated policy and governance arrangements for managing flooding, coastal erosion, biodiversity, climate change and land use planning across Scottish Government, its agencies, and different LA teams.
- A current lack of certainty around longer-term funding to implement and sustain all aspects of CCAPs.
- The challenge of building widespread internal and external support for land-based adaptation.

Responding to these challenges, Scottish Government working together with LAs, could:

- Consider how LA staff resources and expertise can be improved by creating mechanisms to increase staff capacity, recruitment and retention of technical specialists. This could also be complemented by a Scottish Government advisory team.
- Improve the alignment of CCA work with ongoing coastal flood risk management, climate change, biodiversity and planning policy obligations.
- Secure appropriate levels of long-term CCA funding for all phases of CCAP delivery and evaluation.
- Prioritise CCA funding for specific adaptation actions such as nature-based solutions and land-based retreat.

- Design a cross-government and multi-level initiative to raise awareness, champion, and embed coastal adaptative thinking across elected members, Scottish Government agencies, public bodies and wider stakeholders involved in activities at or near the coast.

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Abbreviation	Definition
CCA	Coastal Change Adaptation
CCAP	Coastal Change Adaptation Plan
CCC	Climate Change Committee
CCRA	Climate Change Risk Assessment
Coastal Risk Management	Monitoring of coastal change, and use of hard and soft engineering infrastructure and/or use of nature-based solutions to alleviate coastal erosion and flood risks triggered by climate change hazards (storms, sea level rise).
DC	Dynamic Coast
FRMP(s)	Flood Risk Management Plan(s)
GIS	Geographic Information Systems
Land-based adaptation	Planning and actions on land that minimise exposure and vulnerability to coastal change hazards such as making space for the coast to dynamically adjust (e.g. dunes rolling landwards) or the re-location of at-risk assets.
LA	Local Authority
LDP(s)	Local Development Plan(s)
LIDAR	Light Detection and Ranging/Laser Imaging, Detection, and Ranging
NPF4	National Planning Framework 4
Non-CCA funds	Any other sources of funding, internal and/or external to the LA, that are not either of the two types of CCA funding (direct allocation or case study).
SCOTS	SCOTS Flood Group, group for LAs on flood related matters
SEPA	Scottish Environment Protection Agency
SG	Scottish Government
SMP(s)	Shoreline Management Plan(s)
SNIFFER	Scottish Northern Ireland Forum for Environmental Research
UKCP18	United Kingdom Climate Projections 2018

3 Introduction

3.1 Climate change risk and policy context

3.1.1 Coastal climate change science and adaptation

Sea level rise will exacerbate both coastal erosion and flood risk to coastal communities and infrastructures in Scotland in the coming decades (Rennie et al., 2021). The latest projections for sea level rise come from the Met Office's UK Climate Projections 2018 data set (UKCP18) (Palmer et al., 2018). Projections anticipate up to 1.16m of sea level rise in Scotland by 2100 under a RCP 8.5 (high emissions) scenario. This scenario was most closely aligned with (within 1% of) actual global emissions between 2005 and 2020 (Schwalm et al., 2020). Even with drastic action – if global net zero were to be achieved tomorrow – significant global sea level rise is expected to continue beyond this century to 2300, where, in the case of low-likelihood high impact ice sheet events, up to 15 m of sea level rise cannot categorically be ruled out (IPCC, 2021).

The general scientific and government consensus on climate change adaptation is that acting sooner will greatly reduce societal risks and costs (Global Commission on Adaptation Report, 2019). International research on coastal climate change adaptation shows that future landward retreat of assets may be required to manage the long-term risks of erosion and flooding (Haasnoot et al. 2019) under a high sea-level rise scenario. Alongside coastal risk management measures, Haasnoot et al. (ibid) recommend consideration of options such as landward retreat now, even though these may lack political and public support. Furthermore, taking adaptation actions now that maximise flexibility for future generations[1] is the most intergenerationally just approach to living resiliently with coastal change (Teodoro et al. 2022). However, policy and financial arrangements for landward retreat - such as planned relocation to manage slow-onset impacts of climate change - are still at an early stage (Boston et al. 2021).

Following principles set out by the Scottish Government in its CCAP guidance (2023a) it is recommended that all levels and sectors of government and businesses with land responsibilities for any people, assets or land near the coast, such as railway assets, port authorities or historical sites, support LAs in developing coastal change adaptation plans (CCAPs) and implementing actions (e.g. limiting development in places of anticipated enhanced risk, building resilience and planning for dynamic adaptive pathways approach). This multi-level governance approach is needed to help reduce harms to people, assets and infrastructure from expected increased landward migration of the shore, and erosion-enhanced flooding as climate change risk factors such as sea-level rise accelerate (Birchall et al. 2023).

3.1.2 Legislative and policy overview

A number of legislative instruments and policies must be considered by LAs with interests at the coast, as well as public bodies such as Transport Scotland and Scottish Water, and

[1] Making space now for future adaptation will reduce future vulnerability of assets and people by avoiding lock-ins (e.g. building in places now of expected future risk) and thus reduce future damage costs.

private companies (such as utilities) that have coastal infrastructures. The policy context sets the delivery mechanisms through which legislative requirements are discharged. Many of the marine and/or land-based policies that cover coastal communities and assets: (1) require consideration in CCAPs, and related plans to support the implementation of CCAP actions such as LDPs; (2) have a wider geographic or sectoral scope than the coast (e.g. the Scottish National Adaptation Plan (SNAP3), and; (3) can have conflicting priorities (e.g. shorter-term economic development goals versus long-term adaptation requirements).

National Level: Scotland's Climate Change (Scotland) Act 2009 (as amended) combined with Scotland's Flood Risk Management (Scotland) Act 2009 (FRM), provides the overarching legislative framework for assessing and responding to climate-change related coastal risks. Coastal flooding comes under the legal remit of the Scottish Environmental Protection Agency (SEPA). SEPA's activities include the mapping and updating of present and future coastal flooding in order to meet the requirements of the FRM (SEPA 2023), and they work with local authorities who have responsibility for scheme delivery (see below). SNAP3 sets out national policy for adaptation in Scotland in response to the UK Climate Change Risk Assessment 3 (CCRA3). The latter highlights that risk of flooding from all sources to people, communities and buildings is the costliest hazard facing businesses, and remains one of the most severe climate change risks for communities and assets in Scotland. SNAP3 sets out its approach to improving the resilience of coastal communities in objective C6 - "Coastal communities are preparing for and adapting to coastal erosion and sea level rise" - and encourages the use of nature-based solutions for resilience, partnership working and taking a place-based approach to climate adaptation (Scottish Government, 2024a). The Public Bodies Climate Change Duties (PBCCD) contained within the Climate Change (Scotland) Act 2009 require listed public sector organisations, including LAs, to act in the way best calculated to help deliver the statutory Adaptation Plan and to report progress annually. This is a key mechanism that makes climate adaptation a legal imperative for public bodies in Scotland.

Since 2008, the Scottish Government has made available £42 million per year to local authorities to invest in flood resilience actions – a commitment that is in place until 2026. The 2020 Programme for Government committed an additional £150 million over the course of this Parliament for flood risk management actions. A further £12 million was also allocated for Coastal Change Adaptation (CCA).

Fostering collaborative governance between the Scottish Government and LAs is a core national policy concern articulated in the Verity House Agreement (2023). This partnership aims to adequately fund and give powers to LAs to help tackle poverty, transform the economy through a just transition to deliver net zero, and deliver sustainable person-centred public services (Scottish Government 2023b). Funding from the Scottish Government to LAs will not be ring-fenced (unless there is a clear rationale for such ring-fencing). This agreement thus provides LAs more flexibility in regard to how the Capital Grant is used.

Local Authority Level: LAs undertake coastal management under the remit of the Coast Protection Act (1949) where they are designated as Coast Protection Authorities (HM Government 1949). LAs have operational responsibility for managing flood risk within their areas. LAs are also required by wider Scottish policy to take a place-based approach to

development (Our Place, 2024) that includes working with local communities to develop locally supported solutions to environmental challenges.

For coastal LAs, CCAPs and Flood Risk Management Plans (FRMPs) are the key documents regarding erosion and flood risks, and coastal defence measures. These documents act as material considerations within land use planning applications, along with relevant local plans, and the National Planning Framework 4 (NPF4). The NPF4 sets planning policy for Scotland, and states that the global climate emergency must be addressed in local planning policy. It should be read as a whole, however, NPF4 Policy 10 provides the supporting criteria for development proposals in coastal areas and Policy 22 focuses on strengthening resilience to flood risk through avoidance as a first principle, although other adaptation and resilience actions are also noted (Scottish Government 2023b).

In line with NPF4, when creating Local Development Plans (LDPs), LAs must consider climate change risks including the exacerbation of coastal hazards such as flooding and erosion due to acceleration of sea level rise and increases in storm surge heights. Six of 24 coastal LAs have existing Shoreline Management Plans (SMPs), which can provide a starting point for developing CCAPs. To date, one LA (Moray Council) has produced a CCAP, while two other LAs (Highland Council and Scottish Borders) began their CCAP in 2023/24[2].

Both national and local level policy frameworks establish climate adaptation as a cross-cutting responsibility, and this remit is discharged through a number of departments at multi-levels of government including spatial and community planning, roads, flood risk, asset management, climate, and biodiversity teams.

3.1.3 Coastal Change Adaptation (CCA)

The UK's Climate Change Committee (CCC), which advises governments across the UK, has set out principles for good adaptation planning (CCC 2023). These include: the integration of adaptation into other policies; adaptation to a projected 2°C global temperature rise, and an assessment of the risks accompanying a 4°C rise; an avoidance of policy lock-ins; preparation for unpredicted extremes; research into funding metrics, and; an assessment of the interdependences between different climate risks. These principles underpin the Scottish Government's coastal adaptation pathways approach, which provides information and financial resources.

Adaptation Scotland (2019), a capacity building programme for adaptation funded by the Scottish Government, developed an 'Adaptation Capability Framework' that sets out four key capabilities public sector organisations will need to develop to deliver adaptation. These key capabilities cover: organisational culture and resources; understanding the challenge; planning and implementation; and working together with communities, multi-level government actors and wider stakeholders. The CCAP guidance detailed in Section 3.1.3.1 provides information on two key aspects of the capability framework: understanding the challenge, and planning and implementation.

[2] See: https://www.dynamiccoast.com/cca

3.1.3.1 Coastal Change Adaptation Pathways for Scotland

CCAP guidance: The published guidance comprises of advice for LAs on the need for and creation of CCAPs and illustrates the kinds of adaptative practice required to safeguard coastal communities and assets as climate and coast continue to change (Scottish Government, 2023a, p4). Specifically, the coastal adaptation pathways approach provides options for managing future coastal risks through the identification and monitoring of future 'trigger points' that are likely to emerge along Scotland's coasts. Triggers can include short term hazards such as storm impacts as well as the longer term (decade plus) hazard of rising sea levels. Triggers can also comprise of policy changes, land use changes, shifting insurer and/or community attitudes to coastal risk.

These anticipated trigger points can be responded to by a range of actions ('pathways'), some of which are more in line with adaptation to enhanced risk ('adaptive pathways'). The decision to switch from one pathway (such as continued maintenance of a sea wall) to another pathway (such as the relocation of assets further inland) due to a trigger point being reached can be detailed in a CCAP as sequential stages that acknowledge the benefits and limits of specific management measures (Scottish Government, 2023a).

CCA funding: Scottish Government CCA funding has been provided on a **direct allocation** basis as part of a 4-year funding cycle begun in 2022-23. To date, three rounds of **direct allocation** funding have been awarded. As agreed with COSLA (through the Settlement and Distribution Group) the amount provided to each LA has been proportional to the national share of the assets predicted to be at risk of erosion (Figure 1).

Case study funds were introduced in 2023-24 with the aim of developing and sharing learning about coastal change adaptation. Amounts (ranging from £33K to £440K) were distributed after an application process, a recommendation by a working group, and approval by the Scottish Government.

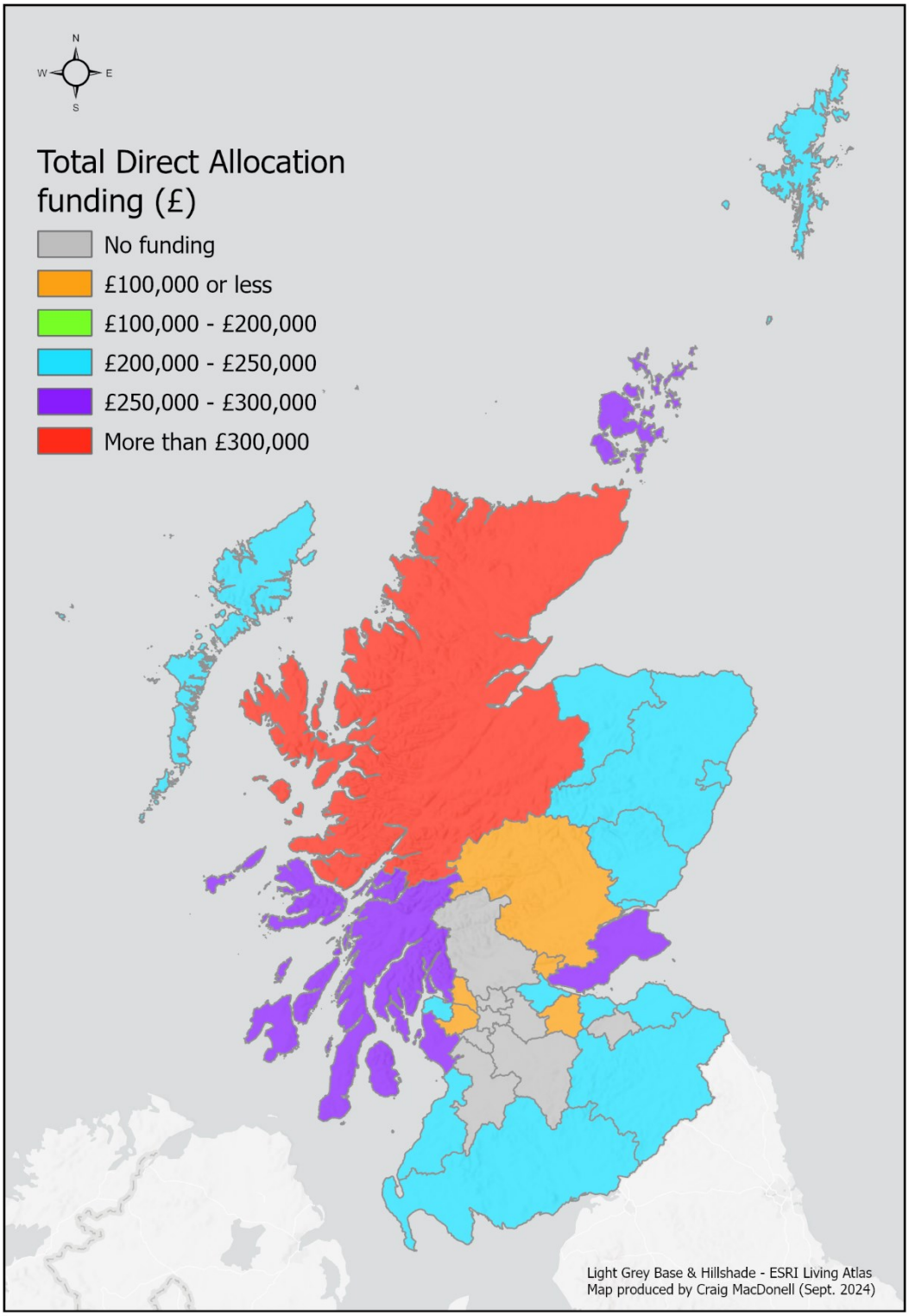


Figure 1: Map of LAs showing total amount of **direct allocation** CCA funding received up to July 2024, where no LAs were awarded funding between £100-200K (coloured green in key but not present on map). Data provided by the Dynamic Coast 2 project (Rennie et al., 2021) – which maps and calculates historic (1980s) to modern (varying dates) erosion rates and models future erosion risk – was used to assess the assets at greatest risk (www.dynamiccoast.com) and hence the eligibility of LAs (see Appendix A). Eligible LAs were given the **direct allocation** funds with policy objectives and suggested activities set out in the funding letter.

3.2 Research questions and methodology

3.2.1 Research Questions

The following questions were used to frame the research into coastal LA awareness of sea level rise-associated risks; how LAs have used the Scottish Government's funding allocation, and; the different barriers to planning for coastal change adaptation that have emerged:

1. To what extent are LAs aware of (a) the need for coastal adaptation in their area and (b) the work involved in managing identified risks?
1. What coastal adaptation work has (a) been delivered to date, and (b) is currently being planned?
2. In undertaking CCA, (a) what decision-making processes are involved in planning and carrying out coastal adaptation, and (b) how is the impact of the adaptation work evaluated?
2. What proportion of the funding received to date has been allocated to coastal adaptation?
3. How much of the allocated money has been spent per year for each funding type?
4. What proportion of funding allocated via the coastal change programme has been rolled over into future financial years?
5. To what extent have LAs forecast their coastal adaptation funding needs, including the magnitude of the funding needed and the funding options?
3. What are the barriers to planning and implementing coastal adaptation (including, but not limited to, the monitoring of coastal adaptation needs, the funding mechanism, local awareness, collaborations, and broader governance issues)?

From the empirical findings, and observations on these, suggestions have been made for: (a) short term improvements for planned future funding rounds, and; (b) the consideration of broader-scale governance, finance and structural barriers and enablers (Section 5).

3.2.2 Methodology

A mixed methods approach to answering the above questions comprised:

- An analysis of funded **case study** bid documents.
- A survey distributed to each of the 24 eligible LAs. 19 respondents completed and returned the survey on behalf of their LA.
- Key informant interviews and focus groups with officers in eligible LAs. 12 interviews were completed, and 11 participants took part in the focus groups.

The collected survey data indicates broad patterns of activity and opinion, whereas the interviews/focus group data allow for more nuanced insights into how LA officers engage with CCA. Importantly, those who took part in the research – the majority of whom work in flood risk management in LAs – have provided information based on their own informed, situated understanding of the issues, and so the empirical findings should not be taken as either exhaustive of LA officer experience, or as representative of LA officer opinion in general. The information collected comprises important insights into the experience of work on coastal change adaptation but, the specific notes, opinions and suggestions reported here have not been signed off by individual LAs or by COSLA on behalf of all LAs.

The research was undertaken following the Economic and Social Sciences Research Council's framework for ethical research involving people, wherein informed consent was obtained and participant anonymity ensured to build trust and openness in responses.

A full methodology is provided in Appendix A.

4 Research results and observations

4.1 To what extent are LAs aware of (a) the need for coastal adaptation in their area and (b) the work involved in managing identified risks?

Key findings

- There was widespread awareness of the need to embed coastal change adaptation across a range of LA activities.
- Participants were keenly aware of the scale of this challenge, particularly in regard to shifting from risk management to a new, adaptative approach.
- Scottish Government guidance/training and external consultants played a significant role in helping to outline the scale of the work involved in identifying risks.
- Most of the CCA funding was spent on bringing in external consultants, due to a lack of knowledge/skills in house (see 4.5.1 Staff capacity)

4.1.1 Adaptation awareness and scale of the challenge

Survey respondents demonstrated a high awareness – 74% being 'acutely aware' – of the need for coastal adaptation. Awareness of the scale of the challenge involved was also evident in how participants talked about adaptation pathways as a different way of thinking about coastal risk. The following are examples of how interviewees expressed this point as a shift in perspective:

- "[I]t's going to be adaptation rather than protection..."
- "[The community] always thought that they need to be protected. Adaptation is completely different and it may mean moving away from the area."

These responses indicate that there is high awareness of climate change enhanced coastal risks, and that more conventional risk management or coastal protection activities were recognised as being insufficient. They also demonstrate an openness to the fact that assets may need to be relocated in some instances. This is a positive finding in terms of an appetite to engage and change existing practices, and future engagement with LAs should ensure that this is appropriately developed upon. For example, future training may not need to go "back to basics" in terms of describing the risk or need for adaptive land-based approaches.

4.1.2 The work involved in managing identified risks

The question of the scale of work involved in managing the risks differently interpreted by participants. Some participants discussed risks for developing the CCAP, for example, whereas others discussed risks in implementation. Several interviews and focus group participants articulated challenges with identifying the coastal change risks involved so that they could be managed. The following quotes illustrate the diversity of reasons given for this, including understanding the data inputs to the CCA process and how the adaptation pathways trigger work:

- "We're still trying to get our heads around what all that [Dynamic Coast] data is showing"

- “The biggest challenge is understanding what we're trying to do... We're so early doors into it. … it was trying to work out what [a] trigger looks like?”
- “The big issue we've got with looking at this, and in terms of knowledge and evidence, we don't have the in-house skills and the knowledge to do this.

A majority of survey respondents reported spending CCA funds on external staff resources with fewer respondents reporting investing CCA funds on internal staffing. Interviewees and focus group participants reiterated this important reliance on external consultants to assist with risk identification, as these quotes attest:

- “So we're very heavily relying on consultants.”
- “So [consultant] developed [CCA CS funding bids] for us, in partnership with us, which is really good.”
- “Our consultants mostly are really good because they've got data that we didn't even know we had… we’re heavily relying on the consultants to go into the detail…”

Expert support from Scottish Government was highly valued as an aid to understanding the work involved in CCA planning. All of the survey respondents had used or extensively used nationally funded research and datasets such as Dynamic Coast and SEPA flood maps, with a large majority indicating that these data were helpful or even critical to their CCA and/or coastal risk management work. Less than half had participated in training sessions in the use of national data sets. Most survey respondents had used the CCAP guidance, while almost all of the survey respondents had attended the Scottish Government’s annual Flood Risk Management conference.

More nuanced feedback provided in the interviews/focus groups indicated that, as LAs are largely at an early stage of CCA planning, the CCAP guidance might be further developed to reflect this. Several suggestions were made, including adding more technical guidance, more detail on the transition from a SMP to a CCAP, and further consideration of the lack of awareness (in and outwith LAs) of the risks to coasts from climate change. Relevant remarks included:

- “It [the CCAP guidance] is useful for the understanding of the key person taking the CCAP forward. It does not assist too much in breaking down the barriers to implementation.”
- “It [the guidance] is very useful as the CCAP format is new for us … however more practical examples and guidance should be included …”

Although the work of consultants has generally been positively received and is useful to quickly bring in expertise to the development of CCAPs, the “heavy reliance [sic]” on consultants could lead to a lack of institutionalisation of knowledge needed to understand the data, identify trigger points and produce CCAPs accordingly in the future. The issue of internal staff capacity as a barrier to progress is explored further in 4.5.1, and the use of consultants in 4.5.5. In future rounds of funding, Scottish Government, in conversation with LAs, could consider how staff resources and expertise (either from consultants or internally) for coastal change adaptation could be improved; this may be through new mechanisms to increase staff capacity, training for in-house specialists and mainstreaming of knowledge across different parts of the LA.

Scottish Government expertise is also well-received by the participants of this research and the widespread use of nationally funded data sets and their utility is encouraging. Further case studies and improved guidance for using these data sets would enhance this offering in future rounds of funding.

4.2 What coastal adaptation work has (a) been delivered to date, and (b) is currently being planned?

Key findings

- The adaptation awareness noted in Section **Error! Reference source not found.** is not yet matched by overall progress, and only one LA has completed a CCAP to date with CCA planning elsewhere at an early stage.
- The researchers found that other LA funding (neither **direct allocation or case study** funding from the coastal change adaptation funding mechanism) was used towards coastal risk related activities. The majority of non-CCA LA funding is spent ad hoc in response to storm events and/or ongoing maintenance of coastal risk management assets. Risk management remains a core area of ongoing and planned LA activity using both CCA and non-CCA funding.
- The case studies provide early signs of a shift to: (a) nature-based solutions (NBS) over conventional engineering measures to manage coastal risks, and; (b) adaptive thinking in the form of awareness raising activities and plans for future landward retreat of assets.
- A majority of survey respondents reported future plans to use CCA funds to undertake land-based coastal adaptation actions, while around one-third report plans to raise awareness of climate change-related coastal risks.
- The completed, ongoing and planned work clearly demonstrate the importance of CCA funding in enabling LAs to begin the shift from risk management to coastal adaptation.

4.2.1 Delivery to date

Based on participant responses, there is limited evidence of completed adaptation activities in the first 2.5 years of the funding allocation (up to September 2024) though there is widespread evidence of awareness raising and preparatory work as shown in fig. 3. There is little evidence in this time period of CCA funds used for land-based adaptation actions, although planning for future retreat of assets has been initiated with **case study** funds. Moreover, reporting through the Dynamic Coast website shows that **case study funds** are supporting ongoing projects which include use of nature-based solutions and trialling the use of shingle to reduce erosion rates.3 One CCAP, for Moray4, has been completed.

[3] www.DynamicCoast.com/cca

[4] Moray CCAP committee report: https://moray.cmis.uk.com/moray/CouncilandGovernance/Meetings/tabid/70/ctl/ViewMeetingPublic/mid/397/Meeting/2192/Committee/9/Default.aspx

The majority of participating LAs are at an early scoping stage (adaptation awareness raising, gathering data) in the coastal climate change adaptation process, with just over half of respondents indicating that their LA is "just getting started." They cited prospective completion dates between early 2025 and early 2026.

The interview/focus groups responses provide insight into the diverse reasons why progress on spending CCA funds, and thus the delivery of coastal adaptation, has been slow. These have included challenges around dealing with storm impacts, staff capacity, tight timescales, capital and process delays, and competing priorities with short-term statutory obligations taking precedent (see Section 4.5 on 'Barriers').

These findings suggests that, although, as explored in 4.1, there is a high awareness of the levels of risk associated with sea level rise including coastal erosion and flooding, at the time this research concluded (September 2024) only a few CCA projects had been delivered with the majority of CCA projects were either underway or planned. This could be due to a number of factors including constrained public finances and staff capacity, meaning that LAs have to prioritise more immediate risks above longer-term adaptive action. However, there is an ever-narrowing window of opportunity to act preventatively, reducing the need for more expensive or disruptive interventions in future. Increasing statutory obligations or strengthening coastal aspects in the public bodies reporting requirements could be a potential way of remedying this gap between awareness and action.

4.2.2 Actions currently underway

Survey responses show that CCA funds have primarily been used to undertake awareness raising for the need to adapt, present and future adaptation planning, future resource forecasting and funding to support CCAP delivery, and the identification of nature-based methods. Six respondents stated that their LA had not yet used the distributed CCA funding (Figure 2); potential reasons for this include re-profiling (see 4.4.2).

No respondents reported that their LA had used CCA-funds to implement land-based coastal adaptation actions such as retreat of assets or creating future accommodation space on land for natural coastal assets to roll landward as climate change impacts accelerate, although a few indicated planning was being done for this. This could be expected given the early stage of funding cycles.

The survey findings also indicated the important role of non-CCA funding in the delivery of both risk management and land-based adaptation. Almost half of respondents reported that non-CCA monies (i.e. from other parts of the LA budget) had been used to repair flood and/or coastal risk erosion infrastructure, and one third reported the use of non-CCA monies for awareness raising activities. They also noted that the majority of non-CCA LA funding is spent ad hoc in response to storms, issues raised by the public and/or staff reporting impacts.

A few respondents also reported the use of non-CCA funds to undertake land-based adaptation in the form of planned retreat of existing assets in their LA.

These findings show that there are a diverse range of adaptation activities delivered by CCA funding, with community engagement and awareness raising most commonly reported by respondents. Community engagement and awareness raising as primary activities is to be expected, as it is important to create a baseline of understanding and engagement to

increase public support for future adaptation actions. That some respondents had not used any of the CCA funding warrants further exploration as to why this might be and what barriers are in place (see 4.5). The use of funding from non-CCA fund sources is both expected (e.g. nature-based solutions could also be funded with biodiversity funding) and interesting, particularly in its ad hoc nature. It would be useful to explore further how different sources of funding in LAs complement each other; whether the non-CCA funding was used because the CCA funding was insufficient or harder to mobilise; and how actions under a coastal change adaptation "umbrella" are split between CCA and non-CCA funding.

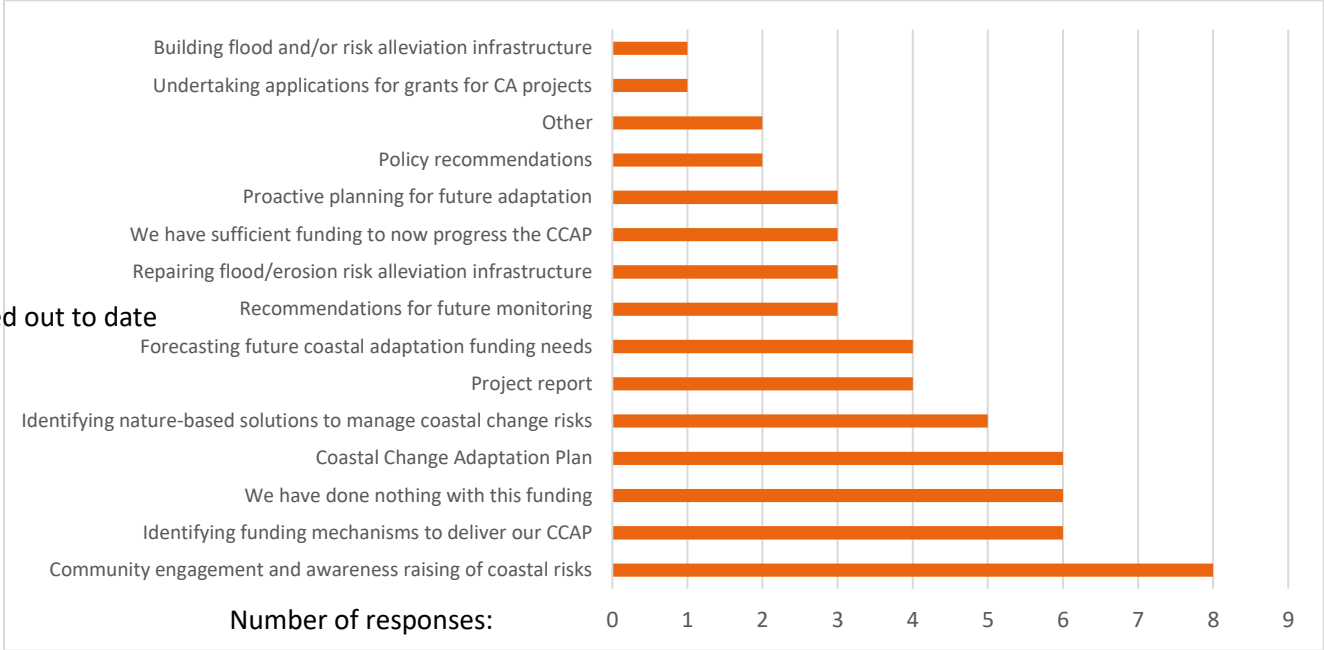


Figure 2. Number of responses (x-axis) of all activities (y-axis) carried out with CCA funds (**case study** and **direct allocation**)[5]. This graph does not show the proportion of the budget spent on these activities but rather how many respondents reported these activities being undertaken or planned.

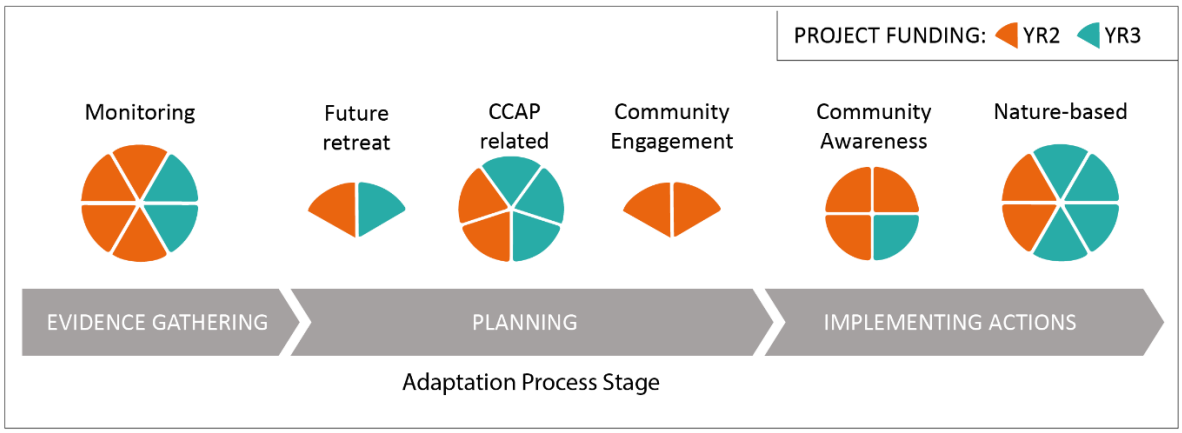
[5] When asked to report all activities carried out with CCA funds, respondents report the use of CCA funds for community engagement and awareness raising (42%), adaptation plans (37%), the identification of funding for CCAP delivery (32%), the identification of nature-based solutions to manage coastal change risks (26%), forecasting coastal adaptation funding needs (21%), project reporting (21%), developing recommendations for future monitoring (16%), planning for future adaptation (16%), and policy recommendations (11%). Only a few (16%) LAs indicate the use of funds for repairing and one (5%) building flood and/or coastal erosion risk alleviation assets. A few respondents (21%) also report not having done anything with the CCA funds.

4.2.3 Case study spending by activity type

The analysis of successful **case study** funding bids[6] provided insights into LA spending patterns. To note that this is the money bid for rather than the actual monies allocation. This gives an incomplete picture but evidences priority areas of action within the LA. Figure 3 plots the **case study** spend planned for various activities and their place in the coastal change adaptation process (from evidence gathering, and planning, through to implementing action).

The analysis highlights a predominant spend on risk management related activities (including monitoring and implementation of risk management actions), and a significant focus on supporting adaptation planning activities. Least spend of **case study** monies is associated with community engagement planning and actions, a finding that is at odds with the survey response noted in Section 4.4.2, where most participants noted that CCA funds (both **direct allocation** and **case study**) had been primarily used for awareness raising activities. This could be explained by the fact that the **case study** data, only corresponds to 11 LAs, as opposed to the 19 indicated in the survey who received **direct allocation** funds and that the evidence was for planned rather than actual spend (Appendix A).

In the awarded **case study** bids, community engagement and the use of nature-based solutions to manage erosion risk were an emerging area of focus for LAs, and includes projects such as dune restoration. To a lesser extent, funds were allocated to two projects which focussed on planning for future retreat, including the future realignment of footpaths inland (Figure 3). Though there is evidence of planned future action, notably, no Case Studies are as yet implementing land-based adaptation options, such as a managed realignment of assets near the current coastal edge. This shift in focus to future adaptation planning aligns with non-CCA spend which although is predominately used on a more ad hoc basis for responding to storm events, in a few cases it has also been used for planned retreat of existing assets (Section 4.2.2). Whilst limited to two **case study** projects, this is in keeping with and the gaps in CCA guidance and funding for planned retreat reported by survey respondents and focus group and interview participants, respectively and with the early stage of the adaptation process.



[6] Successful bid documents were provided by the project steering group. Information on case studies is available at https://www.dynamiccoast.com/cca.

Figure 3 details the planned spend on **case study** funding per year where activities within awarded projects were categorised into broad activity types (e.g. monitoring, future retreat, CCAP related, nature-based or awareness raising) and positioned in relation to adaptation process stage (from evidence gathering to planning to implementing actions). The number of activities does not correlate with the amount of funding awarded, where nature-based actions and monitoring were the most expensive activities funded. Data are derived from awarded **case study** funding bids and were categorised by the research team.

Spending was not equal across activity type. Analysis of the awarded bid documents highlights a predominant spend on risk management related activities (monitoring and use of nature-based solutions, with one NBS project securing £440K), and a significant focus on supporting adaptation planning activities including community engagement, supporting CCAP development and to a more modest extent, planning for future retreat. In future, it will be important to track adaptation spending more closely so that the costs of internal staff time, as well as the different types of activities can be better evaluated. This will help evaluate the relative costs of different components of CCAP development, delivery and evaluation to help prioritise future spend. The results also convey that, broadly, lower cost interventions (community awareness raising activities) have been the most popular adaptation activities undertaken by LAs. It will be important to ensure in future rounds of funding that the impact of this public engagement is measured to gain understanding of where spend is having greater impact.

4.2.4 Future actions planned

The majority of survey respondents indicated that their LA plans to undertake a range of coastal adaptation actions in the future, including coastal change adaptation planning, risk management, awareness raising, nature-based and transformative, land-based coastal adaptation. Interview and focus group participants also expressed concern over the lack of long-term adaptation funding and the scale of resources required to deliver all types of adaptation, particularly ensuring there is sufficient funding to implement the actions within coastal change adaptation plans (Section 4.5). These results show that there is strong willingness to progress adaptation in the future as long as sufficient funding to support this work can be identified.

4.3 In undertaking CCA, what decision-making processes are involved in planning and carrying out coastal adaptation, and how is the impact of the adaptation work evaluated?

Key Findings

- The specificities of LA internal governance structures, particularly the siloed nature of working, are key to understanding decision-making. However, there were minimal findings on the specific nature of decision-making processes from this particular study.
- Once adaptation work had commenced, availability of evidence and staff expertise were key factors influencing how adaptation work was planned and carried out.
- As discussed in Section 4.1.2, national datasets and the expertise of consultants were crucial in supporting decision-making by helping address internal expertise gaps regarding CCA.

- No respondents stated their LA was at the stage of evaluating adaptation progress.

4.3.1 Internal governance factors

In the short period of time dedicated to qualitative data gathering and due to the complex nature of LA governance procedures it was not possible to gain a detailed understanding of the decision-making processes involved in working on coastal change adaptation in LAs. However, there were some key observations of similarities and differences between local authorities that may help inform any future or longer-term studies of process (see also Section 4.5). For example, the siloed nature of LA governance structures was a recurring theme with a lack of mainstreaming of coastal work within LAs:

- "I'm assuming, it's most councils will be the same … the coastal side is sort of added on to the flooding team you know."
- "The internal set up in the Council is that each service is responsible for protecting its own asset, so there isn't a central team looking after that on behalf of other people."

These structures have an impact on the ability to apply for or access CCA funds. Participants noted a range of different experiences accessing or applying for CCA funds, with the approval of plans and budgets within their LA dependent on governance structures and protocols, as reflected in these quotes:

- "… our directors did see our applications, and the head of services did see the applications. They didn't change anything."
- "… our standing orders say we need to have permission to submit the bids from committee. So, we've, now think we've got round that, by putting it in our committee report, we should be able to submit them, or to a certain value .... So potentially we can't get bids in in time because the window might open in August and close in October. But actually we need a 12 week window for us to even get approval."

These governance factors led to local variations in the ability of technical officers in LAs to secure CCA funds to deliver CCA work, illustrating the impacts of organisational culture and organisational decision-making processes on CCA delivery.

4.3.2 Use of consultants and evidence in decision-making

As discussed in Section 4.1.2, LAs relied heavily on consultants for understanding and decision-making. Moreover, all respondents indicated they had used or extensively used nationally funded research and datasets such as Dynamic Coast and SEPA flood maps, where some had undertaken training to support LAs in their use (see 4.1.2). In terms of decision-making, there was widespread discussion in focus groups and interviews on the use of consultants and the use of national datasets. A few participants provided specific examples of how they had used these datasets as evidence for decision-making in individual planning applications and/or for strategic initiatives such as the development of a CCAP, citing the fundamental use of these data:

- "Yeah, I mean the, the outputs from Dynamic Coast are really the basis on which we've been doing our plan".

These findings provide encouraging signs of a growing, practical use of national datasets by LAs in both routine and strategic decision-making processes. This usage could be further supported in future funding rounds.

4.3.3 How is the impact of adaptation work evaluated?

None of the survey respondents noted that their LAs had begun to monitor, review or evaluate adaptation work. Evaluation is currently limited to tracking spending, and climate change reporting duties, which varies between local authorities (see Appendix C). With time it will be possible to refine adaptation implementation tracking techniques to evaluate adaptation progress, and use this to identify best practice in the design of CCAPs and/or the implementation of adaptation actions

4.4 How much of the funding has been allocated to adaptation action? How much has been spent per year and how much reprofiled? To what extent have future funding needs been identified?

Key Findings

- Given the uncertainty over how Directly Allocated CCA spending is monitored the participants were not in a position to provide information on allocation given to adaptation activities. Moreover, efforts to map **direct allocation** spend on coastal adaptation would have been difficult due to a lack of a uniform system of recording spend via adaptation stage (i.e. evidence, planning and implementing) and activity type.
- LA spend to date of both types of CCA funding (**direct allocation** and **case study**) has been slow; most survey respondents indicated that they had spent less than 25% of the funding received in years 1-3 of the funding programme.
- Slow spend needs to be carefully contextualised with insights from participants that clearly indicate the positive benefits of being able to carefully plan and aggregate funds across years. Indeed, we found evidence of reprofiling across all three years of the funding programme.
- There has been limited forecasting of future funding needs to date but there is high awareness of the potential magnitude of spend needed, for all types of adaptation actions and particularly for land-based adaptation action.
- The majority of LAs receiving **case study** funding did not secure any additional outside funding or in-kind support for their **case study** activities. Less than one-third of LAs receiving **case study** funding indicated that they had received additional funding, e.g. from internal LA sources and/or from external organisations.
- There were mixed views on the value of CCA **case study** funding compared to **direct allocation** funding.

4.4.1 What proportion of the funding received to date has been allocated to coastal adaptation?

It was not straightforward to ascertain how CCA funding has been spent in practice. There were mixed returns to the survey as to whether there was a process for monitoring spend within a given LA.

More specific findings regarding **case study** spend can be drawn from the successful applications. Over the two years, 15 of 24 eligible LAs have applied for funding and 12 have received funding, with some LAs taking forward more than one **case study**. As noted in Section 4.2.3, results show the spending has been allocated across a range of activities in the different stages of adaptation progress (Figure 3). The majority of **case study** funding has been spent on evidence gathering via monitoring and risk management actions using nature-based solutions (NBS). This is followed by adaptation planning and community engagement plans and/or actions. Only two small projects were funded to develop proactive adaptation plans for future landward realignment of: 1) coastal paths and 2) golf courses to manage erosion risks. It is expected that the **case study** funds have primarily been used for risk management and monitoring in order to first understand the levels of risk before further action can be taken. The smaller projects focused on landward realignment of assets indicate that the money is being used for proactive adaptation measures even at an early stage.

4.4.2 How much distributed CCA funding has been spent per year for the two streams?

LA spend to date of both types of CCA funding (**direct allocation** and **case study**) has been slow; most survey respondents indicated that they had spent less than 25% of the funding received they received in years 1-3 of the funding programme. Only a few of survey respondents noted that their LAs had spent all of their **direct allocation** fund from Years 1 and 2. In regard to the successfully bid for **case study** funding, a similar pattern of slow spend emerged.

The interviews and focus groups provide insights into the positive planning value of the internal reprofiling capacity, wherein unspent monies can be spent in the subsequent financial year.

- “There’s a key point we would have failed … if we’d been forced to spend it in the year … the fact that we were able to roll it over made it work”.
- “So the fact that it’s spread over three years makes it a lot easier for us to manage. […] So we have projected a spend for the next 3-4 years with our finance guys to say we will spend this, but we’re not going to spend that much in the first year. That definitely helps.”
- “[O]ver the last couple of years, I think … [it has] effectively been just sitting there and rolling forward at the moment and that was an attempt to keep it there to partly pay for the flooding engineer.”

On the other hand, if **direct allocation** monies are not tied down to specific activities, the actual and potential for it to be used on non-CCA work as part of general LA spending was noted by some respondents, as illustrated here:

- “The constraint is general capital grants. … that’s the biggest constraint about the funding is that it is not, … [going where] it should be going to”.

- "It [the lack of ring-fenced funding] makes it very difficult for us. It's a challenge. Which is why you see things like adaptation plans, taking the time they're taking, because the money just isn't there … and it's not for want to do it, but it becomes a secondary task"
- "[I]t could get lost because it just goes in the general allocation, and that's my concern is that, if it's going to general allocation continuing, it's just a random lump of money. There is a risk that, … as the Council's tighter and tighter on the capital budgets, that that money will not be allocated to coastal works."

However, other participants found the **direct allocation** funding to be very useful, as they were able to lever additional capital grant funding. This illustrates that variations in internal financial structures in LA led to differences in technical officers accessing CCA funds. Future research could explore this issue to help minimise risks this variability poses to delivery of CCAPs.

Although spend thus far has been slow the ability for LAs to internally reprofile funds between financial years has been highly appreciated, meaning that spend can be ramped up towards delivery of projects further along the planning process. **direct allocation** funds are not, however, ringfenced, which increases the risk of the CCA monies not going directly towards coastal change adaptation. Some participants expressed experience of and/or worry that **direct allocation** monies would end up financing other LA projects. Others appreciated this flexibility as it allowed them to lever in additional capital grant funding. Improved reporting on budget and spend within LAs and between LAs and Scottish Government would help monitor this spend, ensure its being allocated appropriately and determine whether, for future funding rounds, there can be flexibility for LAs to be involved with funding discussions as to whether a ring-fenced or non-ringfenced funding structure is most effective for coastal adaptation planning.

4.4.3 What proportion of funding allocated via the coastal change programme has been reprofiled into future financial years?

We found evidence of reprofiling occurring across Years 1-3 of the CCA funding cycle. However, we were not able to ascertain what proportion of the funding allocated has been reprofiled into future financial years. The majority of survey respondents indicated a reprofiling of **direct allocation** funding across the first two years of the funding cycle. Fewer responded a reprofiling of Year 3 funding.[7] Negative impacts of reprofiling that emerged were few and related to wider governance issues such as trying to accrue enough funds to recruit a temporary technical officer position to work on CCA, but the vacancy not being filled for a variety of reasons.

4.4.4 To what extent have LAs forecast their coastal adaptation funding needs, including the magnitude of the funding needed and the funding options?

[7] It is worth noting that Year 3 funding relates to the current 2024-25 financial year, so these figures present rollover of funding already agreed in July, when surveys were completed.

From the qualitative data gathered during the short period of research, there was limited direct evidence of funding forecasting where only four LAs had used CCAP funding to forecast future adaptation funding needs (Figure 2). The research also found that there was limited awareness of alternative funding schemes to the CCA fund. However, there was a general consensus among (and consistent concern conveyed by) participants of the high magnitude of future funding needed.

As an indicator of the magnitude of future funding needed, a majority of survey respondents reported that they would support a significant increase in CCA funding. Over half of respondents also supported further funding of national monitoring where this is additional to future CCA allocations to LAs. More nuanced feedback provided by participants expressed widespread concerns over the availability of future funding to allow CCAPs to be implemented to manage future risks as the discussion on barriers (Section 4.5.4) and this quote illustrates:

- "Whatever happens, there's, you know that there's gonna be more [coastal adaptation] work than there is money,"

Survey respondents also conveyed limited awareness or use of other funding sources to support delivery of CCA related work where less than one-third of LAs receiving case studies indicating they had received additional funding, e.g. from internal to the local authority and/or from external organisations.

These findings show that there is limited forecasting of future funding needs or knowledge of alternative funding schemes, but high awareness of the magnitude of future funding required to effectively manage coastal change. It is perhaps expected at this early stage of adaptation planning to find that there has been limited forecasting of future funding needs. Future funding rounds could fund CCA work which forecasts future funding requirements, so that case studies illustrating the scale of the work involved can be generated to inform policy.

4.5 What are the barriers and enablers to planning and implementing coastal adaptation?

Key Findings:
The main barriers to delivery of coastal change adaptation in LAs are as follows:

- A lack of staff, and expertise, to deliver CCA work, sustained over time
- Knowledge gaps within LAs and the relative newness of the adaptation pathways approach
- Internal LA decision-making processes that impact ability to access CCA funds.
- Integrating CCA into already complicated policy and governance arrangements for managing flooding, coastal erosion, biodiversity, climate change and land use planning across Scottish Government, its agencies, and different LA teams.
- A current lack of certainty around longer-term funding to implement and sustain all aspects of CCAPs.
- The challenge of building widespread internal and external support for land-based adaptation.

4.5.1 Staff capacity

Staff capacity was noted as a major barrier to CCA delivery, comprising limitations on staff capacity deriving from existing workloads, the increasing scope of their remits, and challenges in recruitment.

Stretched resources across broad remits and urgent pressures are illustrated in the following quotes:

- “And the difficulty we've got is we've got an additional £XXX, but we don't have the resources to actually get spending it”.
- “So we didn’t spend, for example, we didn’t do as much as we should or as we planned, because most of the team was dragged or diverted to do the landslides and the bridges.”
- “There are lots of funding streams coming out from government, for which LAs have to do a bit of work in the application process. There’s no guarantee of success. Well that’s taken up a lot of resource which could be prioritised in different ways… [T]hat’s another hurdle we have.”

The challenge of recruiting staff with relevant expertise was also noted:

- “We've got a huge coastline in XXXX, but we don't have a designated coastal engineer… [W]e have tried… to recruit… ”

Acute staff resource challenges meant that consultants were involved in writing **case study** bids as well as the delivery of CCA projects. These quotes illustrate this point:

- “[H]ad it not been for us, employing XXX consultants to do it, I don’t think we would have done that ourselves. … We don’t have the resources internally to be able to fill in the [case study application] detail,”
- “And one of the comments from my senior manager was we'll just give it to consultants and they can do it. And I went, but we still need to manage the consultant… [W]e still don't have that resource”.

These challenges to staff capacity - both in terms of resource and the “right kind” of resource i.e. those with technical experience - pose significant risks to delivery of CCA funds. There needs to be future consideration of how institutional, technical and resource related hurdles can be overcome in subsequent rounds of funding. The employment of technical consultants has been useful but there needs to be further action to retain and institutionalise knowledge of CCA. Both Scottish Government and LAs should consider how staff resources and expertise can be improved by creating mechanisms to increase staff capacity, recruitment and retention of technical specialists. Additionally, there should be further work to improve the alignment of CCA work with other related activities within LAs and with government agencies.

4.5.2 Knowledge barriers

Related to the above findings on staff capacity and resource, most survey respondents highlighted staff expertise to support the CCA policy area as a modest or significant barrier**.** In addition, over half noted the limited availability of risk data as a barrier to the delivery of CCA policy.

Interview and focus group responses provide more insight into the types of knowledge gaps thought to be relevant. Participants referred to knowledge gaps on urban and cliffed coasts, sea levels, tidal data/wave overtopping, storm event impacts, and public priorities, as well as challenges associated with negotiating between different information sources, and sense checking uncertainties. Several participants also expressed concerns over having to intercalibrate erosion and flood risks with limited guidance, and their overall efficacy in interpreting individual and combined data.

Participants were acutely aware of the benefits of building an in-house knowledge base, as evidenced by an attempt to pool CCA funds across years to hire staff (Section 4.4). The following quote illustrates this point.

- "We need to have ownership of this, in our own authority. And I think to take money and then just pay a consultant to give us a report on what we generally know is not the best use. I think we need to understand ourselves what the issues are".

Some focus group participants also discussed the limits of the geographic extent of Dynamic Coast data for urban areas behind coastal defences which are comprised of erodible sediment and the impact of this on their ability to gather evidence of coastal change to develop their CCAPs. They expressed a wish for more guidance on what to do in a heavily urbanised coastal area, guidance on managed retreat of assets and clearer links between NPF4 and Dynamic Coast data:

- "A bit more [guidance] from government SEPA whoever on what do we do in a heavily urbanised coast. We have no clue what our triggers and actions are gonna look like…"
- "How do we deal with managed retreat? How do we deal with relocation? How do we deal with making space because actually that might be something you think about the next 10 years in your next plans."
- "Clearer guidance between what is in NPF4 and what is in dynamic coast 2 in terms of how the DC results are interpreted and used would be a great help."

Most focus group participants articulated the value of having centralised expertise in supporting the delivery of CCA work thus far (Section 4.1.2). Salient suggestions were made to further support aligning policies and data at a national scale including:

- Greater alignment of policies, roles and responsibilities including aligning of erosion and flood risk were identified as means of enabling more efficient and effective delivery of CCA work:

  "because it is the same thing, predominantly it's about protecting people from the risk of water".

- The creation of a centre of excellence to bring together government agencies, LAs and other stakeholders to share practice:

  "a centre of excellence [would help], or a resource you could go to that would say well, this is what we've done here, because this very much like

other funds, it's streams are just thrown out to 32 LAs in Scotland and everybody's doing their own thing"

- The creation of a central data and results sharing portal, where DC results are presented in a manner that is more accessible to non-specialists:

  "towards a single portal, coastal should be trying to head towards a single point of information that [is] anything to do with [the] coastal environment. We just go there".

  "It would be really good if we… work towards a kind of coastal, a sort of national source for coastal erosion rather than have to each authority have to pick it [up]… themselves… it's just that big picture that's useful".

These findings suggest that for future rounds of CCA funding LA practitioners would appreciate more guidance on how to use existing data sources, in-house training, and mechanisms for retention of knowledge and aligning with other parts of LAs. They expressed an interest in coastal and a national or centralised "one stop shop" data source, presented in a non-technical/accessible way.

4.5.3 Awareness raising

A lack of awareness of the risks of climate change-enhanced coastal hazards was noted as a barrier to progress. An urgent need to strengthen awareness of the need for CCA across multiple sectors and levels of governance was identified by some survey respondents, as these free-text responses indicate.

- "Need to create a greater awareness in related departments and also at a higher management/elected members level"
- "From our point of view, there seems to be a lack of prioritising the coastal issues. Maybe the coastal change adaptation plans will help focus it a bit more".

This point was further nuanced by interview/focus group participants, with an overall emphasis on the skills development required to engage people in the issue:

- "[A]ctually some better understanding about how to engage is probably more important [than further planning]"
- "Help us educate others [to understand]... Educating others within the Councils, … elected members, director level … maybe something at a higher level about why the government's doing this stuff? […M]ight might be useful. Top down, [r]ather than bottom up".
- "Sometimes I, I wonder about the community engagement and public education, perception, that side of things. If flood risk officers are necessarily the best people to do that, you know? … Rather than 12 different LAs all trying to develop those skills and reach out to their communities, ... I wonder if maybe a more centralised resource might be able to do that".

Importantly, the Scottish Government's commitment to empowering local communities was reiterated as a key mechanism for raising awareness is evidenced in the following quotes:

- "I think they [the Scottish Government] need to be looking about how they can fund the Community Council led projects, and those sort of things".

- “Empowering communities by practicing better machair and dune management, … [to see] the benefits of leaving a buffer”.
- “I do feel like if we could just give the community the money, then they'll get that done so much more efficiently than we can because we've got prioritised lists and you know, all the rest of it”.

From the findings it is evident that land-based adaptation action is going to require higher levels of support and coordination within and between LAs, Scottish Government and from the wider public. Awareness raising is thus a key component of CCA delivery and a skill that needs to be fostered within LAs and Scottish Government. These findings convey the need for further widespread work to raise awareness at the political level for the need for CCA and the importance of governmental or director-level weight behind CCA decision-making. Participants recognised the important role of community councils, and of ensuring that these are better resourced both for awareness raising and delivery of projects.

4.5.4 Financial Considerations

There were a number of financial barriers to delivery of CCA including: the short term nature of the funding; the timing of internal financial processes and approvals in LAs; the discrepancy between the cost of creating a CCAP versus the unknown or large cost of its actual implementation, and; the cost of monitoring. In the context of wider Scottish Government and local authority budgeting processes, these are often year-to-year or based around parliamentary cycles which can be difficult to navigate when considering long term investment in change.

A recurring theme in focus groups was the short-term nature of the CCA funding, with an illustrative quote being:

- […] the big issue to address as well is [...] how the large scale stuff [is] going to get funded in the future because this [funding] runs out in two years. So what's going to happen and how does that work in the future”.

A few participants noted the challenge of lining up their LAs financial management such as committee cycles, internal approval timescales, and LA capital grant allocations.

- “[W]e don't know about this money early enough. So the committee cycles are in January, February, March for your budgets and you're going for approval. You really need to be having all this sorted about this time [July] of year. So we can write the reports to get into the capital plan before capital plans are being agreed.”

Some survey respondents and participants also noted the large cost and/or questioned the value of creating expensive CCAPs without long-term funding to underpin their implementation, as these free text response and participant data show:

- “CCAP thus far is very expensive and time consuming, funding is the biggest threat to completion of the process.”
- “[H]aving a plan, if there's no multi year funding sitting there waiting to be used [...] it's just a piece of paper. It's going to sit [in the] draw[er] and not get touched again… we don't want to spend £XX,000 on our adaptation plan just to tick a box and say we've got an adaptation plan. We want to do an adaptation plan that means something to the people here”.

Further to this, participants also expressed concerns about the ability to implement the ongoing monitoring and work required to deliver a trigger-based CCAP, which requires ongoing monitoring where they lack sufficient staff resources, as these quotes indicate:

- " The reality with the length of coastline that we have is that we are not going to monitor every single bit of coast soft erodible coast coastline that has a community link to it and keeping an eye on it every year …. So how do you actually then use the dynamic pathway approach. In practise, if you if you just don't have the resources to go out and keep monitoring"
- "The other big issue from my side is we're jumping in [to adaptation planning] and it's the same across the whole of flooding… We are [taking a] strategic approach when we're not maintaining what we've already got".

For future funding rounds options to apply for long-term CCA funding for all phases of CCAP delivery and evaluation would be a step forward in providing security and longevity for implementation of CCAPs. Funding could also be prioritised, as per the requirements for **case study** finding, specifically for work on NBS or land-based retreat.

5 Conclusions

This concluding section summarises the main findings and provides suggestions for policy to consider when funding CCA in future.

5.1 Adaptation awareness, progress and spend to date

Empirical findings from all data sources clearly indicate that flood risk technical officers (the predominant job family of research participants and primarily those carrying out CCA work in LAs) have widespread awareness of adaptation need and the scale of the adaptation challenge, including the need to adapt rather than protect to live resiliently with coastal change. They displayed a keenness to progress CCA work, are highly aware of the existential threat of future accelerated Sea Level Rise and the need for, and challenges inherent in, transitioning from a risk management to enhanced adaptation approach involving land-based retreat.

Whilst spending of CCA funds to date has been slow, it is also clear there has been significant momentum aimed at understanding the place-based impacts of climate change risks and the challenges involved in determining appropriate actions. This involved a broad range of activities ranging from evidence gathering, risk assessments, adaptation planning and initial community awareness raising through to implementing risk management actions using nature-based solutions. The slow progress to date on spending CCA funding, and the internal to LA structural and resource challenges identified in the delivery of CCA work, suggest that future funding and further engagement is needed to overcome substantive staff resourcing, internal finance structures and multi-level governance barriers impeding adaptation progress.

5.2 Decision-making, staffing and knowledge gaps

The variations in local governance structures are key to understanding decision-making and barriers to delivery, and to help inform how multi-level governance support can be optimised to leverage adaptation (Birchall et al. 2023). Although little evidence was found

on internal decision-making processes, siloed working and resourcing challenges were evident. Reduced staff capacity and lack of suitable expertise, along with organisational challenges in how funds were directed to LA coastal teams or onto community councils sometime impeded spend. Participants indicated a keen willingness to grow in-house staff expertise. However, they identified multiple factors limiting this such as overstretched staff, and difficulties in being allowed to appoint and/or in attracting, growing and retaining suitable expertise. This led to widespread use of consultants who played a key role in delivery of nearly all types of CCA work.

Whilst the support of Scottish Government in training and advising LAs was highly valued, and the CCAP guidance and national datasets (e.g. Dynamic Coast) were well used to help understand the challenge and assess risks, participants noted a need for further assistance in interpretation of the guidance and addressing gaps in the national datasets.

5.3 Scale of the work involved and financing forecast

Participants were aware that the current, perceived short-term nature of the current CCA programme is a key barrier to developing CCAPs. Moreover, the majority of participants showed a high understanding of the large future, ongoing costs to monitor and/or implement coastal change adaptation using a dynamic pathways approach. This led to several respondents questioning the value of producing CCAPs, as uncertainty about future spend meant that they might not be able to deliver on any commitments or monitoring of the CCAPs. Certainty over the long-term financing to deliver the ongoing requirements of CCAPs, would help address a major concern for participants. This approach aligns with global recommendations to finance adaptation to slow onset climate change impacts like sea level rise (Boston et al. 2021).

5.4 Enablers

Participants identified a series of enabling factors that supported them with their CCA work to date, the majority of which stem directly from the Scottish Government's Dynamic Coast programme. These include the provision of the CCA guidance on managing coastal change, specific CCA related training events and national datasets including the Dynamic Coast for erosion and SEPA's flood risk maps. CCA funding has been pivotal for enabling LAs to move from an ad hoc, reactive approach to managing urgent coastal risks to a planned adaptation approach that combines conventional risk management with increased use of nature-based solutions to manage erosion risks, and planning for land-based adaptation, including future relocation of assets inland. Participants and the research team generated several ideas to further enhance these important enablers. These are detailed in 5.7.

5.5 Barriers

Numerous barriers to CCA progress were identified that broadly related to four key topics: staff capacity, knowledge, awareness raising and financial considerations. Some of these barriers are specific to CCA funding, whilst the majority are also indicative of local government decision-making processes and widespread structural, financial and governance arrangements that directly impact on the ability of the participant LAs to develop and deliver their CCAPs. These barriers map directly onto Adaptation Scotland's Capability Framework, clearly showing that organisational culture and resources and working together

are as important as the need for robust evidence to understand the challenge and to plan and implement adaptation. Addressing all types of barriers is thus crucial for future CCA work, and in helping Scotland's public sector move from starting to more mature phases of coastal adaptation to climate change.

In addition to the noted knowledge gaps, CCA funding and policy specific barriers were:

- Lack of staff expertise to deliver CCA work, regarding both technical and engagement aspects of this.
- The high cost and time-consuming process of developing CCAPs.
- The lack of longer-term funding to implement all aspects of CCAPs.
- Varying levels senior official and elected member support in prioritising and raising adaptation awareness.

Wider policy, structural, financial and governance related barriers included:

- More pressing statutory obligations or emergency response situations that limit progress on adaptation planning
- Internal LA decision-making processes and governance structures limiting ability to access CCA funds for CCA related work.
- Multi-sector policy and multi-level governance arrangements for managing flooding, coastal erosion, land use planning across Scottish Government, SEPA, and different local authority teams.

5.6 Suggestions for policy

Over the current funding cycle and beyond there are a series of suggested ways in which the Scottish Government could further enhance the enablers to coastal adaptation, reduce the identified barriers and in doing so, accelerate the pace by which LAs are able to develop, implement and evaluate their CCAPs. These insights would enhance the ability of Scottish Government, its agencies, devolved bodies (e.g. Scottish Water) and LAs, indeed all actors with assets at the coast, in delivering key legislative and policy requirements such as the coastal and community objectives in SNAP3 and the policies set out in NPF4. Such an approach could accelerate Scotland's ability to deliver intergenerationally just, climate resilient development pathways. Working together with the above-mentioned actors, future interventions for Scottish Government could include:

On **staff capacity**:

- Address chronic lack of staff capacity and staff expertise by creating mechanisms to increase staff capacity, recruitment and retention of technical specialists.
- Consider using of CCA funds to develop sustained in-house expertise, as well as funding a national level expert body to support LAs on an ongoing basis.

On **knowledge**:

- Improve the CCA guidance to improve ease of use, including simplifying the structure to differentiate between coastal risk management and land-based adaptation, and the different evidence levels, types and approaches that can be used for each.
- Enhance provision of training and advice in using data to LAs, to provide or improve the skills needed by LAs to deliver CCA.

- Develop a national data programme that combines coastal hazard data (e.g. coastal flooding, wave overtopping, erosion, sea level, storms) with impacts on society (e.g. assets, communities), ecosystems and planning to reduce current and future risks.

On **awareness raising**:

- Develop activities that raise awareness, champion and embed adaptative thinking across elected members, the Scottish Government, its agencies, LAs, public bodies and wider stakeholders across society to support coastal adaptation.
- Prioritise CCA funding for activities that plan, implement and raise awareness of nature-based solutions (NBS, e.g. dune restoration) and land-based adaptation actions (e.g. retreat of assets or making space on land for beaches to roll landwards).

On **funding and finance**:

- Secure appropriate levels of long-term CCA funding for all phases of CCAP delivery and evaluation, including the national-scale evidence needed to underpin CCAPs.
- Develop a coordinated approach to financing CCA and related funding streams (e.g. flooding, regeneration) and deliverables (e.g. one combined CCAP and FRMP).
- Enhance flexibility in CCA funding arrangements including maintaining reprofiling in LAs, offering both **directly allocated** and **case study** schemes, improved communication of funding timescales and new mechanisms for communities to receive CCA funds.
- Revisit the CCA funding model for **direct allocation** (Figure 1) as more data becomes available

On **governance and decision-making**:

- Increasing the statutory obligations for climate change adaptation and coastal erosion so they are on par with other statutory obligations. This might include the harmonisation of coastal erosion and flooding in policy, such as by a revised Coastal Protection Act (1949) and/or revisions to the Flood (Scotland) Act 2009, would enable development of combined flooding and CCA plans, potentially leading to efficiencies that could increase LA staff capacity
- Improve alignment of CCA work with coastal flood risk management, climate change, biodiversity and planning policy obligations.
- In accord with the Verity House Agreement, work with LAs to understand internal governance structures and decision-making processes that are supporting and/or limiting the ability of technical officers to secure CCA funds for CCA work.

The findings, observations and conclusions have been distilled to provide a series of short-term suggestions for future CCA funding rounds alongside insights for longer-term policy, finance and governance that may help alleviate the substantive internal and multi-level governance, finance and policy challenges that emerged through this research. These insights would enhance the ability of Scottish Government, its agencies, devolved bodies (e.g. Scottish Water) and LAs in co-delivering key legislative and policy requirements such as the coastal and community objectives in SNAP3. Moreover, more transformative approaches to policy framing are identified to support greater harmonisation of coastal flooding and erosion matters, and their combined impacts on land-based policies such as NPF4.

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Appendix A Table of risk-based funding allocation per local authority (FY2022-25)

LA	Risk (Norm. %)	Year 1 (Direct Allocation)	Year 2 (Direct Allocation)	Year 2 case study	Year 3 (Direct Allocation)	Year 3 case study
Highland	28%	£160,000		£83,000	£249,545	£49,000
Argyll and Bute	11%	£160,000			£129,690	£65,000
Fife	10%	£160,000		£126,000	£122,678	£39,000
Orkney Islands	9%	£160,000		£66,000	£111,202	
North Ayrshire	7%	£160,000			£99,727	£99,000
East Lothian	5%	£160,000			£85,064	
South Ayrshire	4%	£160,000		£106,000	£81,239	£99,000
Moray	3%	£160,000			£74,226	£226,000
Shetland Isles	3%	£160,000			£72,313	
Dumfries & Gall.	3%	£160,000		£36,000	£72,313	
Aberdeenshire	3%		£150,000	£56,000	£71,038	
Falkirk	3%		£150,000		£69,126	
Comhairle nan E.S.	3%		£150,000		£67,850	
Dundee City	2%		£150,000		£64,663	
Aberdeen City	1%		£150,000		£60,200	
City of Edinburgh	1%		£150,000		£58,925	£33,000
Angus	1%		£150,000		£56,375	£440,000
Scottish Borders	0%		£150,000	£72,000	£51,913	
Inverclyde	0%		£150,000		£51,913	
Renfrewshire	0%		£100,000			
West Lothian	0%		£100,000			
Perth and Kinross	0%		£100,000			
W. Dunbartonshire	0%		£100,000			
Clackmannanshire	0%		£100,000			
Total	**n/a**	**£1,600,000**	**£1,850,000**	**£545,000**	**£1,650,000**	**£1,050,000**

Appendix B Methodology

This appendix details the methodological approach to the study. There were four aspects to data collection (desk-based literature review, survey, interviews, and focus groups). A mixed methods approach to the research was undertaken, so that richer qualitative data generated through semi-structure interviews and a focus group could supplement the range of topics explored in the survey, which largely consisted of quantitative data. This combination of research methods therefore allowed the research team to explore both breadth and depth with regards to coastal adaptation progress by coastal LAs. The survey ran in an anonymised format, with respondents not required to state the local authority the survey response relates to. This was balanced with the non-anonymised format in which the semi-structured interviews and focus group was conducted (although data has been anonymised for reporting). The study received ethics approval from the College of Science and Engineering ethics committee at the University of Glasgow (application number 300180185) following ESRC's framework (https://www.ukri.org/councils/esrc/guidance-for-applicants/research-ethics-guidance/framework-for-research-ethics/our-core-principles/) .

The collected survey data indicates broad patterns of activity and opinion, whereas the interviews/focus group data allow for more nuanced insights into how LA officers engage with CCA. Importantly, those who took part in the research - the majority of whom (89%) work in risk management - have provided information based on their informed, situated understanding of the issues, and so the empirical findings should not be taken as either exhaustive of LA officer experience, or as representative of LA officer opinion in general.

Desk-based review of literature

An initial review of coastal policy documents and academic literature was used to develop survey, interview questions and focus group topics for the study.

Document Analysis

Analysis of all funded CS bids was used to analyse data for RQ4 – what proportion of funding awarded to date has been spent on adaptation. This allowed analysis and plotting of case studies into different activity types of adaptation (risk management through to proactive adaptation) and activities (monitoring, planning, implementing actions), allowing analysis of the agreed funding plans to be assessed.

Survey

An online survey about LA use of CCA funding and work on coastal adaptation was used to gather data on the extent of coastal adaptation at a local level across coastal LAs in Scotland. The online survey was hosted on Microsoft Forms and ran for approximately one month (5th-July 6th August). All 24 coastal LAs in Scotland were invited to take part in the study. Contact details of Finance Directors and Technical Officers in each LA were provided by Scottish Government officials. Participants were invited to complete one combined survey response per LA.

The online survey consisted of eight sections with a total of 71 questions. Topics explored in the survey include:

- Awareness of the need for coastal adaptation;

- Spending from the CCA fund to date;
- Use of CCA funds to date;
- Use of non-CCA funds or resources for adaptation actions to date;
- Barriers to developing and implementing coastal adaptation;
- Use of coastal data and guidance documents for coastal adaptation;
- Views on use and allocation of future CCA funds;

In total 19 out of 24 coastal LAs completed the survey, a response rate of 79%. There was a 79% RR to surveys (19 of 24 LAs in receipt of CCA funding). The anonymised data on job sector indicated 89%, 17/19 respondents were involved in coastal or flood risk management; 1 was an engineer and 1 was an environmental specialist (SQ70). A broader range of specialists (e.g. finance (n=9) and risk managers (n= 9)) assisted them in completing the surveys (SQ71). The results of this question indicate limited representation from staff with job roles involving engineering (n=2) planning and regeneration (n=4), as well as communities and business (n=3).

Completed responses were downloaded and analysed in Microsoft Excel. Closed-ended survey questions were analysed using descriptive (i.e. summary) statistics and graphs such as bar charts. Open-ended survey questions (i.e. free text responses) were analysed by way of content analysis to identify the main themes in the data. The survey did not collect any personal data, and responses have been anonymised and pseudonymised in reporting.

The survey was used to respond to RQs 1-8. Participants in the survey have been referred to as respondents to differentiate them from interview and focus group participants. See Appendix B for the survey questions and results, including RR per question which varied as not all questions were compulsory.

Interviews

Twelve key informant semi-structured interviews semi-structured interviews were completed (50% RR) with coastal LAs, with the purpose of providing additional, richer qualitative data to topics explored in the survey. Risk management professionals were the predominant job family for interviews. At each LAs choice, these either consisted of individual or group interviews (e.g. 2-4 colleagues from the LA). Eleven interviews took place from 17th July – 6th August, with one additional interview on 9th September. Interviews responded to RQs 1-8, providing in-depth information on LA awareness of coastal adaptation, the use of the CCA fund, and adaptation activities to date.

The interview broadly covered five topics (of 23 questions):

- Awareness of the need for coastal adaptation;
- Use of the CCA fund to date;
- Adaptation work at a local level, and monitoring of this;
- Use of coastal data and guidance documents on coastal adaptation;
- Challenges to coastal adaptation and views on future CCA funding.

Interview questions were sent to participants in advance, alongside an information sheet and consent form to take part in the study. Questions were solely a guide, with the semi-structured approach to interviewing allowing a degree of flexibility in the questions asked, depending on the participant. Interviewees had the option to skip questions that were not

relevant to them and explore additional topics they perceived as relevant. See Appendix C for the interview questions.

At the participant's permission, interviews were recorded and transcribed (with interview notes completed for two interviewees who preferred not to be transcribed). Online interviews were conducted using Microsoft Teams and transcribed using the Microsoft Teams transcription function (and subsequently checked manually for accuracy). In total, 12 interviews were completed, all online. Interviews could either be individual or as a small group, depending on each local authority's preference. Overall, eight interviews were individual and three interviews were as a small group, consisting of 16 interviewees in total.

Transcripts and interview notes were imported into NVivo 14 ((Windows) February 2024 (Release 14.23.3)) and analysed by way of thematic analysis, to identify both the main themes arising from the data, but also how views were shared by interviewees. Interviews were analysed using both an inductive and deductive approach to coding. The six research questions set by ClimateXChange in the project specification, and themes noted in the submitted bid by the research team, were used to structure and guide the development of codes. Alongside this, half of all interview transcripts were read by the researcher to identify emerging themes within the dataset. This hybrid deductive-inductive approach was used to generate different codes for each of the six research questions, which formed the basis of a coding framework to analyse the interview data.

Focus groups

Lastly, a focus group was conducted with representatives from coastal LAs, who were predominately risk managers, to explore the challenges of implementing coastal adaptation at a local level. Focus group participants included both those that chosen to take part in an interview, but also participants that had not. Focus group participants were divided in into three groups, each consisting of participants from different LAs sharing their experience of the challenges of adapting to coastal risk. The focus group therefore provided a space for discussion on place-based (i.e. context specific) adaptation challenges, and drew out lessons of good practice.

Three online focus groups were conducted with representatives from a range of Scottish coastal LAs. These responded to RQs 1-8 and explored LA perceptions and experiences of the challenges of implementing coastal adaptation at a local level, in order to identify lessons learnt and examples of best practice. 11 participants took part, divided into three groups. See Appendix E for the topics explored in the focus groups.

A review of adaptation challenges emerging from the interview data was used to guide the topic list for the focus group. This allowed the focus group to explore research gaps emerging in the interview data on the main challenges to facilitating coastal adaptation at a local level.

The five themes selected for the discussion in the focus group were;

- Theme 1. Knowledge and evidence
- Theme 2. Planning
- Theme 3. Community and stakeholder engagement
- Theme 4. Constraints of funding

- Theme 5. Organisational capacity, structure and governance

Each theme consisted of a main question posed to the group, followed by a series of sub-questions or prompts, depending on the direction of the discussion.

The focus group (titled "Coastal adaptation barriers and challenges") took place online on Thursday 1st August on Microsoft Teams, lasting for a total of 90 minutes. The focus group began with a 15 minute introduction to the research and focus group by the research team, followed by the main part of the session, which was an hour's discussion of focus group themes. For this discussion, participants were split into three parallel sessions in breakout rooms. For the last 15 minutes of the session, participants returned to the main room for a plenary discussion.

Participants were sent an information sheet and consent form in advance of the session, and two groups were recorded using the Microsoft Teams transcription function (at participants' permission). One member of the team acted as a scribe for one of the parallel session, as one participant preferred not to be recorded.

Analysis of focus group data was divided by theme within the research team, by way of thematic analysis using the same methods as for the interviews. In light of the project research questions in the submitted bid, a review was conducted of key points made for each of the five focus group themes, noting if different points were made between the three parallel sessions of the focus group, or whether discussion was broadly similar. The analysis also identified any examples of best practice discussed in the session.

Standardisation of presentation of results

To ensure consistency when presenting between different types of qualitative data, the research team developed a standardised system for describing the results. This was to ensure consistency for the reader to aid clarity when interpreting the results presented.

Table A1. summarises the approach taken and how different groups are referred to in the report.

Classification of data significance	Survey (n=19) – referred to as survey respondents or respondents in the report and represent the participant LAs	Interview (n=12) – referred to as interview participants or participants	Interview and focus groups (n=15) – referred to as interviews and focus group participants or participants
A few	2-3	2-3	2-3
Several	4-9	4-6	4-7
Most	10-14	7-9	8-12
A significant majority	15-18	10-11	13-14

Table A1. Standardisation of references to the numbers of responses for each type of data and clarification of nomenclature of different data types used in the report.

Appendix C Survey questions and results

This appendix has 2 parts: Part 1. List of Survey Questions and Part 2. Survey responses by question number [for closed response questions only].

This survey consisted of 71 questions, the first two of which were the respondents granting consent. The survey was fully anonymised, and where required open-ended responses were altered to maintain anonymity. The survey questions and approach were agreed with the project Steering Committee, where ethics approval was obtained from the University of Glasgow. Data are presented below for the closed ended questions only, where each question contains the raw data in tabular form plus a graph.

Survey guidance distinguished between coastal risk management actions/activities (such as hard and soft engineering infrastructure and use of nature-based solutions) and land-based adaptation actions/activities (such as changing planning policy and/or proactive planning to relocate at risk assets). Survey questions asked respondents to identify coastal risk management actions and land-based adaptation actions their LA had undertaken/planned and included options for monitoring as a coastal risk management activity and planned retreat as well as policy recommendations as land-based coastal actions (see Survey Questions 30 and 32).

Part 1. List of Survey Questions

Aim/Theme	Question with survey number	Open(O) /Closed (C) question
Adaptation Awareness	3. To what extent are you aware of the need of coastal adaptation?	c
Adaptation Awareness	4. At what stage of the Coastal Change Adaptation process would you place your Local Authority? [select the most relevant]	c
Scottish Government Coastal Adaptation Funding Awareness and Spend to Date	5. Are you aware of the Scottish Government's Coastal Change Adaptation (CCA) Funding?	c
Scottish Government Coastal Adaptation Funding Awareness and Spend to Date	6. Has your Local Authority Applied for Case Study funding?	c

Aim/Theme	Question with survey number	Open(O) /Closed (C) question
Scottish Government Coastal Adaptation Funding Awareness and Spend to Date	7. Has your Local Authority been awarded funds for Case Study?	c
Scottish Government Coastal Adaptation Funding Awareness and Spend to Date	8.Regarding direct allocation funding and Case Study funding, please outline the percentage of spend of CCA funds per year (to date)	c
Scottish Government Coastal Adaptation Funding Awareness and Spend to Date	9.Has any of the following year's allocation been rolled forward into other financial years?	c
Scottish Government Coastal Adaptation Funding Awareness and Spend to Date	10. Has your Local Authority undertaken preparatory work for a Coastal Change Adaptation Plan (CCAP) or equivalent?	c
Scottish Government Coastal Adaptation Funding Awareness and Spend to Date	11. If you selected "other", please specify	o
Scottish Government Coastal Adaptation Funding Awareness and Spend to Date	12. To gain an overview of the variety of spending activities across local authorities, please outline/approximate what percentage of your funding has been spent across the following	c

Aim/Theme	Question with survey number	Open(O) /Closed (C) question
Scottish Government Coastal Adaptation Funding Awareness and Spend to Date	13. If you selected "other", please specify	o
Scottish Government Coastal Adaptation Funding Awareness and Spend to Date	14.Was the funding used collaboratively with other LAs?	c
Scottish Government Coastal Adaptation Funding Awareness and Spend to Date	15. If yes, please explain	o
CCA Planning Activities carried out in your authority with CCA funds (CCAF)	16. Has your Local Authority undertaken preparatory work for a Coastal Change Adaptation Plan (CCAP) or equivalent?	c
CCA Planning Activities carried out in your authority with CCA funds (CCAF)	17. Please describe the preparatory work to date (this can include earlier plans), including which teams/specialists were/are involved in the preparation.	o
CCA Planning Activities carried out in your authority with CCA funds (CCAF)	18. Was this planning funded by the CCAF?	c
CCA Planning Activities carried out in your authority with CCA funds (CCAF)	19. Has preparatory work been undertaken?	c

Aim/Theme	Question with survey number	Open(O) /Closed (C) question
CCA Planning Activities carried out in your authority with CCA funds (CCAF)	20. Has your Local Authority produced a Coastal Change Adaptation Plan (CCAP) (or equivalent)?	c
CCA Planning Activities carried out in your authority with CCA funds (CCAF)	21. Not yet but planning to (please provide timeline below)	o
CCA Planning Activities carried out in your authority with CCA funds (CCAF)	22. We plan to finish or have already completed a CCAP in (please provide timeline below)	o
CCA Planning Activities carried out in your authority with CCA funds (CCAF)	23. If you have started/completed the CCAP process, please outline the planned or completed impacts from the design and/or implementation of the CCAP process (please select all that apply)	c
CCA Planning Activities carried out in your authority with CCA funds (CCAF)	24. Which of the following are barriers to DEVELOPING coastal adaptation planning in your local authority? Please note that a question will be asked later about coastal management actions.	o
CCA Planning Activities carried out in your authority with CCA funds (CCAF)	25. Please state any other barriers, and their extent	o
CCA Planning Activities carried out in your authority with CCA funds (CCAF)	26. Which of the following are barriers to IMPLEMENTING coastal adaptation planning in your local authority? Please note that a question will be asked later about coastal management actions.	c
CCA Planning Activities carried out in your authority with CCA funds (CCAF)	27. Please state any other barriers, and their extent	o

Aim/Theme	Question with survey number	Open(O) /Closed (C) question
CCA Planning Activities carried out in your authority with CCA funds (CCAF)	28. Does your CCAP or equivalent contain both coastal risk management (e.g., hard, and soft engineering infrastructure and use of nature-based solutions) and land-based adaptation measures (e.g., changing planning policy and/or proactive planning to relocate at risk assets)?	c
Additional adaptation/coastal risk management actions you have undertaken with CCA funding	29. Have CCA funds already been used to implement any coastal risk management activities?	c
Additional adaptation/coastal risk management actions you have undertaken with CCA funding	30. What coastal risk management activities have CCA funds been used to/planned to implement?	c
Additional adaptation/coastal risk management actions you have undertaken with CCA funding	31. Have CCA funds already been used to undertake land-based coastal adaptation actions?	c
Additional adaptation/coastal risk management actions you have undertaken with CCA funding	32. What land-based coastal actions have CCA funds been used to/planned to implement? [select all that apply]	c
Additional adaptation/coastal risk management actions you have undertaken with CCA funding	33. Have CCA funds already been used to undertake any awareness raising on Coastal Change Adaptation for staff, management, elected members and/or the public?	c
Additional adaptation/coastal risk management actions you have undertaken with CCA funding	34. Please detail below awareness raising activities undertaken:	o

Aim/Theme	Question with survey number	Open(O) /Closed (C) question
Additional adaptation/coastal risk management actions you have undertaken with CCA funding	35. Overall, please select all activities carried out with CCA funds (select all that are relevant).	c
Non-CCA funded Adaptation Planning and/or Coastal Risk Management work	36. Is the adaptation to coastal change being addressed via other activities within your local authority? [select all that apply]	c
Non-CCA funded Adaptation Planning and/or Coastal Risk Management work	37. Since 2020, has your local authority used funding (other than the CCA Fund) and/or internal resources (e.g., staff time) to help deliver any coastal adaptation and/or coastal risk management work?	c
Non-CCA funded Adaptation Planning and/or Coastal Risk Management work	38. What sources of other funding and/or internal resources (e.g., staff time) have your local authority used to undertake coastal change adaptation activities? Please describe these below.	o
Non-CCA funded Adaptation Planning and/or Coastal Risk Management work	39. Has your local authority used other (non-CCA) funding to implement any of the following coastal risk management activities? [select all that apply]	c
Non-CCA funded Adaptation Planning and/or Coastal Risk Management work	40. If you selected "not yet but planning to..." please provide a timeline for this work	o
Non-CCA funded Adaptation Planning and/or Coastal Risk Management work	41. Has your local authority used other (non-CCA) funding to implement any of the following land-based coastal adaptation changes? [select all that apply]	c

Aim/Theme	Question with survey number	Open(O) /Closed (C) question
Non-CCA funded Adaptation Planning and/or Coastal Risk Management work	42. If you selected "not yet planning to..." please provide a timeline for this work	o
Non-CCA funded Adaptation Planning and/or Coastal Risk Management work	43. Has your local authority spent other (non-CCA) funds to undertake any awareness raising on coastal change and/or coastal change adaptation for staff, management, elected members, and/or the public?	c
Non-CCA funded Adaptation Planning and/or Coastal Risk Management work	44. If you selected "not yet but planning to...." please provide a timeline for this work	o
Non-CCA funded Adaptation Planning and/or Coastal Risk Management work	45.Which of the following are barriers you have experienced in DEVELOPING (planning) adaptation actions in your coastal adaptational work (funded though funds other than the CCAF)?	c
Non-CCA funded Adaptation Planning and/or Coastal Risk Management work	46. Please state any other barriers, and their extent	o
Non-CCA funded Adaptation Planning and/or Coastal Risk Management work	47.Which of the following are barriers you have experienced in IMPLEMENTING adaptation actions in your coastal adaptational work (funded though funds other than the CCAF)?	c
Non-CCA funded Adaptation Planning and/or Coastal Risk Management work	48. Please state any other barriers, and their extent	o

Aim/Theme	Question with survey number	Open(O) /Closed (C) question
Use of evidence, guidance and training to support your coastal work	49. To what extent has your coastal change adaptation and/or coastal risk management work been underpinned by nationally funded research and datasets (e.g., Dynamic Coast for erosion, SEPA flood maps)? Select most relevant only.	c
Use of evidence, guidance and training to support your coastal work	50. Please state what datasets/research were used to inform your CCA and/or coastal risk	o
Use of evidence, guidance and training to support your coastal work	51. Were the research/datasets... (optional: detail the datasets used in 'other')	c
Use of evidence, guidance and training to support your coastal work	52. Much of Scotland's CCA work has been informed by Dynamic Coast's centrally funded monitoring and research. How much has this supported your understanding of and/or evidencing erosion risks? Select most relevant only.	c
Use of evidence, guidance and training to support your coastal work	53. What are your priorities for continued existing National data/monitoring and/or risk assessments?	o
Use of evidence, guidance and training to support your coastal work	54. Are you supportive of the CCA fund (CCAF) being used to update National monitoring and risk assessment data?	c
Use of evidence, guidance and training to support your coastal work	55. Much of the Dynamic Coast shoreline change data is now at least 5 years old. The urgency and importance of monitoring coastal change (and therefore undertaking surveys) was recently underlined by the Committee on Climate Change. If the CCA fund (CCAF) were to include coastal monitoring, such as undertaking updated surveys, which approach would you welcome? Please select one option.	c
Use of evidence, guidance and training to support your coastal work	56. Please expand if you wish	o

Aim/Theme	Question with survey number	Open(O) /Closed (C) question
Use of evidence, guidance and training to support your coastal work	57. Does your local authority regularly undertake coastal change and/or risk assessment monitoring? Select all that are relevant:	c
Use of evidence, guidance and training to support your coastal work	58. if you answered NONE to previous question, which of these factors explains why no data are routinely collected by your LA: Select all that apply.	c
Use of evidence, guidance and training to support your coastal work	59. Which types of monitoring data do you collect? Select all that apply:	c
Use of evidence, guidance and training to support your coastal work	60. Have you, as the lead participant, participated in the following on behalf of your local authority since 2021 (select all that apply)?	c
Use of evidence, guidance and training to support your coastal work	61. If yes for the previous question, please reflect on the utility of these training and sharing sessions	c
Use of evidence, guidance and training to support your coastal work	62. Has anyone in your local authority used CCA guidance?	c
Use of evidence, guidance and training to support your coastal work	63. Please reflect on the utility of this guidance for underpinning your adaptation and risk management work.	c
Use of evidence, guidance and training to support your coastal work	64. Please briefly expand to explain why this is the case	o
CCA funded Adaptation Planning and/or Coastal Risk Management work	65. Was there an internal reporting process for monitoring how the funding was spent?	c
CCA funded Adaptation Planning and/or Coastal Risk Management work	66. Have you reported your CCA activities within your Annual Climate Change Duty report?	c

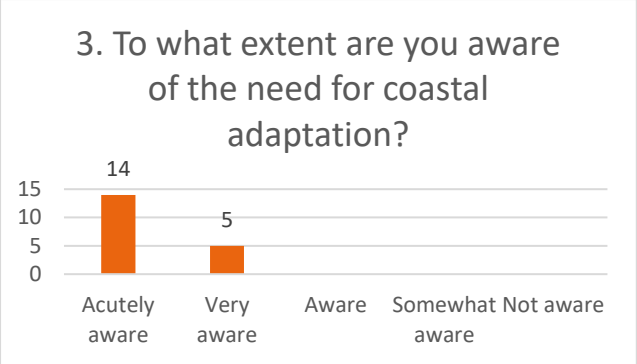
Aim/Theme	Question with survey number	Open(O) /Closed (C) question
CCA funded Adaptation Planning and/or Coastal Risk Management work	67.the 2020 Programme for Government identified £11.7m between 2022-26 (incl. £5m in 2025/26) for local authorities to plan for and start to adapt to ensure we are ready to adapt to current and future climate change risks. Going forward our LA (select the most relevant):	c
CCA funded Adaptation Planning and/or Coastal Risk Management work	68. To deliver coastal change adaptation across Scotland, how do you think should CCA funding be allocated? Select all that apply.	c
CCA funded Adaptation Planning and/or Coastal Risk Management work	69. If the CCA fund were to include coastal monitoring for Scotland (ie. surveys of coastal areas to appreciate erosion etc). Please select all that apply:	c
Contextual information	70. For the primary respondent, which job family/sector best describes your role in the organization? (select the most relevant one only):	c
Contextual information	71. For the primary respondent, which other job family/sectors provided information to help complete the survey (select all that are relevant):	c

Table A1: Table listing survey questions by section and type (open (o) or closed (c) questions)

Part 2. Survey responses by question number [for closed response questions]

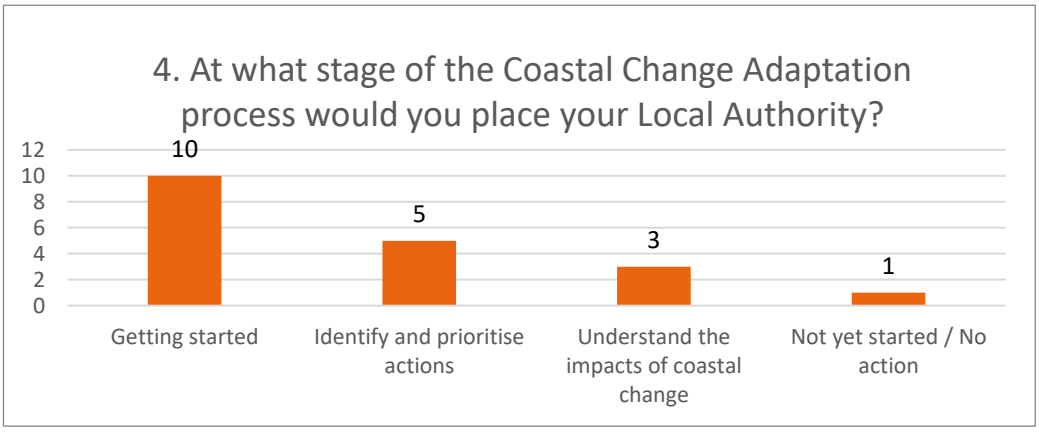
3. To what extent are you aware of the need for coastal adaptation? [select the most relevant]

Survey response value	Count of survey responses
Acutely aware	14
Very aware	5
Aware	0
Somewhat aware	0
Not aware	0
Total responses	19



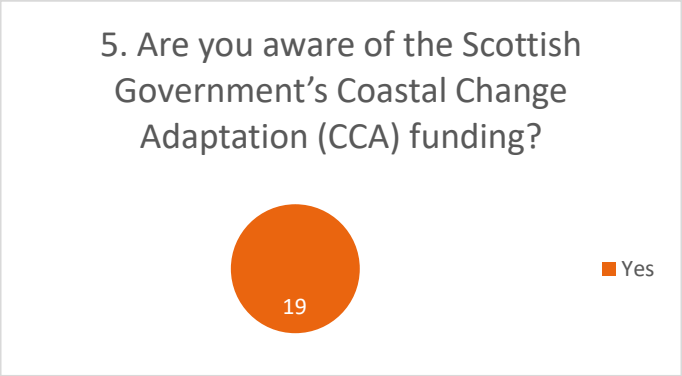
4. At what stage of the Coastal Change Adaptation process would you place your Local Authority? [select the most relevant]

Survey response value	Count of survey response
Not yet started / No action	1
Getting started	10
Understand the impacts of coastal change	3
Identify and prioritise actions	5
Monitor, review and evaluate	0
Total of responses	19



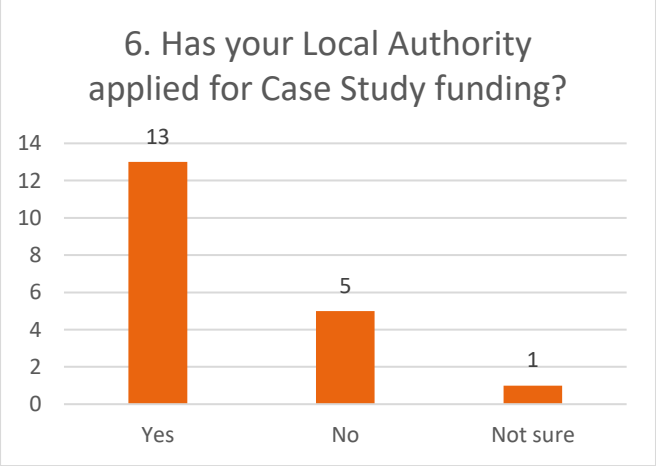
5. Are you aware of the Scottish Government's Coastal Change Adaptation (CCA) Funding?

Survey response value	Count of survey response
Yes	19
Grand Total	19



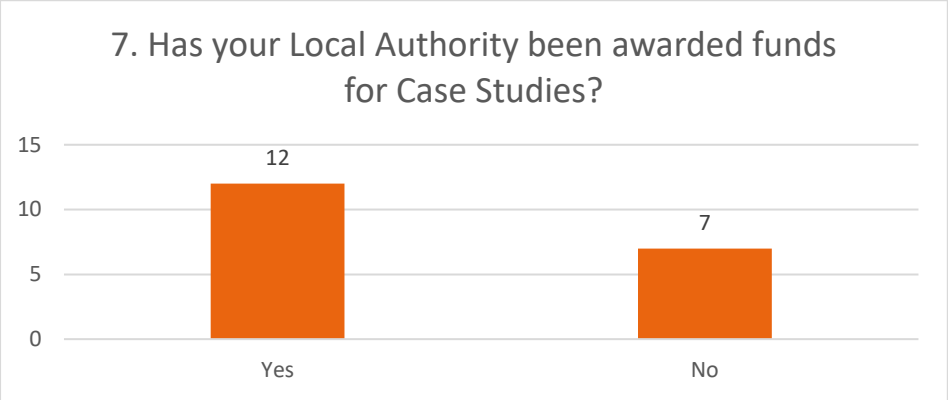
6.Has your Local Authority Applied for Case Study funding?

Survey response value	Count of survey response
Yes	13
No	5
Not sure	1
Total	19



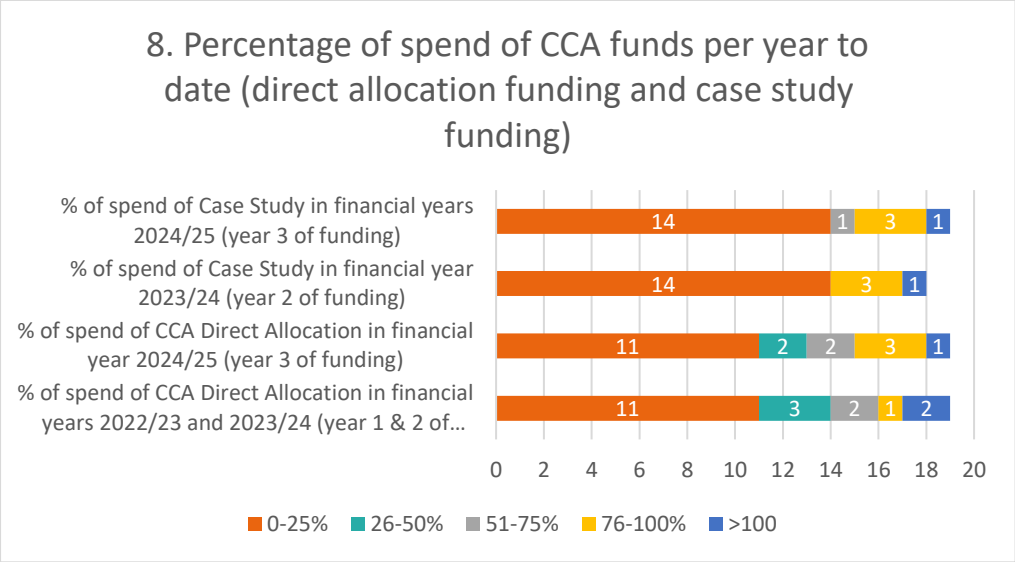
7. Has your Local Authority been awarded funds for Case Studies?

Survey response value	Count of survey response
Yes	12
No	7
Grand Total	19



8. Regarding direct allocation funding and Case Study funding, please outline the percentage of spend of CCA funds per year (to date)

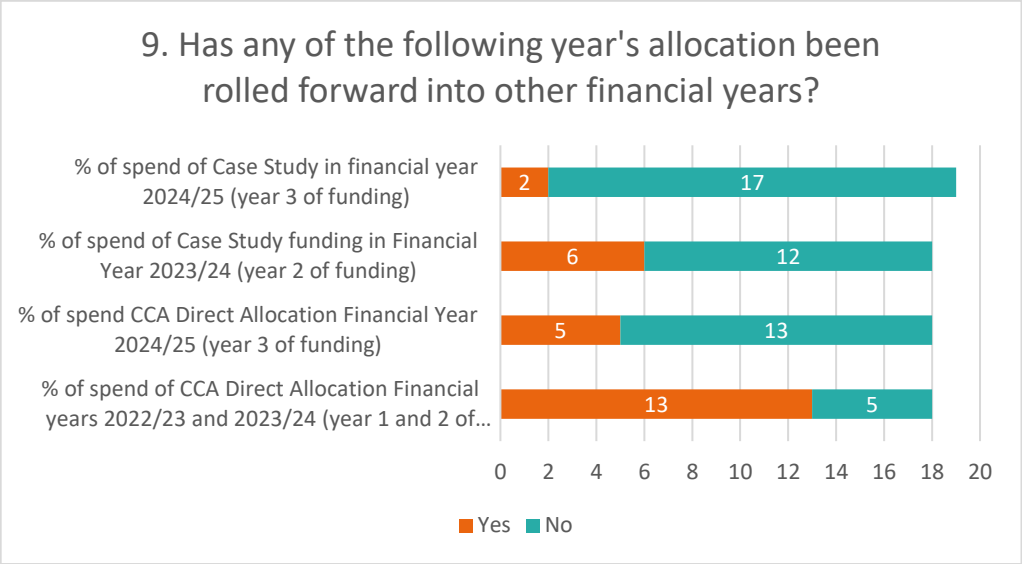
Percentage of spend	0-25%	26-50%	51-75%	76-100%	>100
% of spend of CCA Direct Allocation in financial years 2022/23 and 2023/24 (year 1 & 2 of funding)	11	3	2	1	2
% of spend of CCA Direct Allocation in financial year 2024/25 (year 3 of funding)	11	2	2	3	1
% of spend of Case Study in financial year 2023/24 (year 2 of funding)	14	0	0	3	1
% of spend of Case Study in financial years 2024/25 (year 3 of funding)	14	0	1	3	1



9. Has any of the following year's allocation been rolled forward into other financial years?

Year of funding	Yes	No
% of spend of CCA Direct Allocation Financial years 2022/23 and 2023/24 (year 1 and 2 of funding)	13	5
% of spend CCA Direct Allocation Financial Year 2024/25 (year 3 of funding)	5	13
% of spend of Case Study funding in Financial Year 2023/24 (year 2 of funding)	6	12
% of spend of Case Study in financial year 2024/25 (year 3 of funding)	2	17

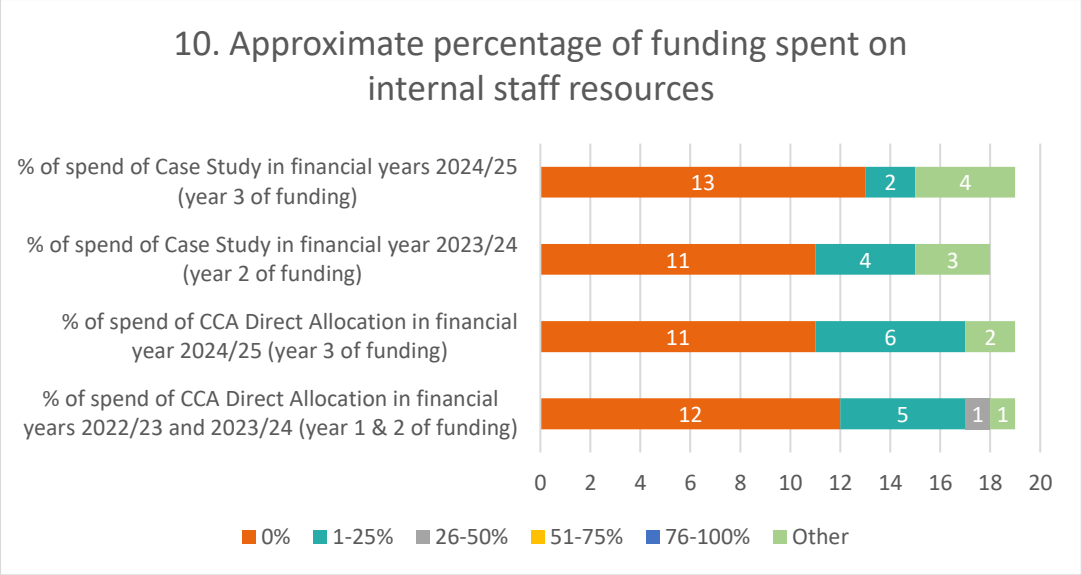
Note- one respondent did not provide an answer for three of the four options



10. To gain an overview of the variety of spending activities across local authorities, please outline/approximate what percentage of your funding has been spent on internal staff resources across the following:

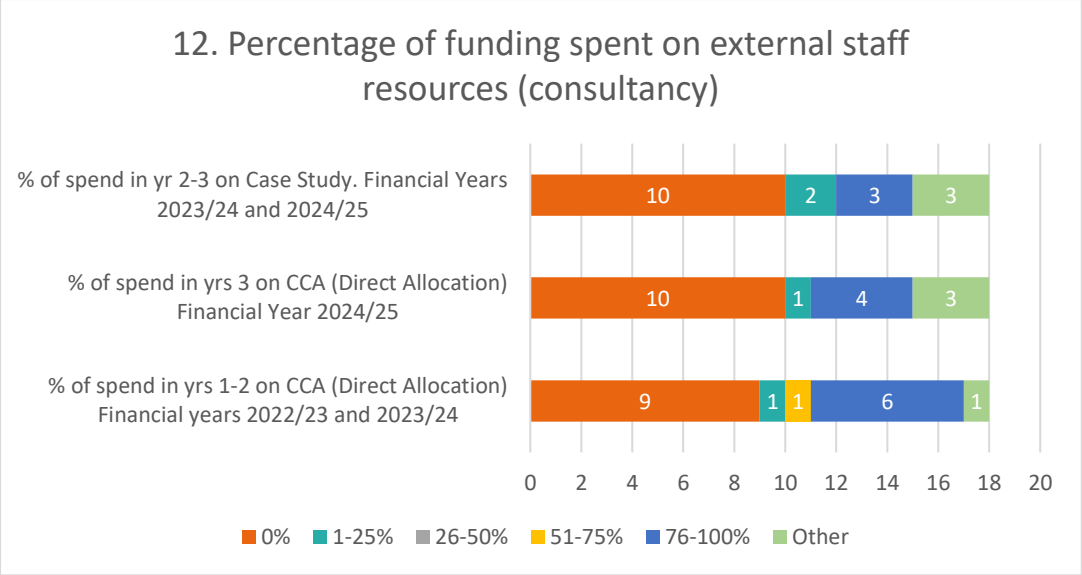
Percentage of spend	0-25%	26-50%	51-75%	76-100%	Other
% of spend of CCA Direct Allocation in financial years 2022/23 and 2023/24 (year 1 & 2 of funding)	12	5	1	0	1
% of spend of CCA Direct Allocation in financial year 2024/25 (year 3 of funding)	11	6	0	0	2
% of spend of Case Study in financial year 2023/24 (year 2 of funding)	11	4	0	0	3
% of spend of Case Study in financial years 2024/25 (year 3 of funding)	13	2	0	0	4

Note – one respondent did not provide an answer for one of the four options.



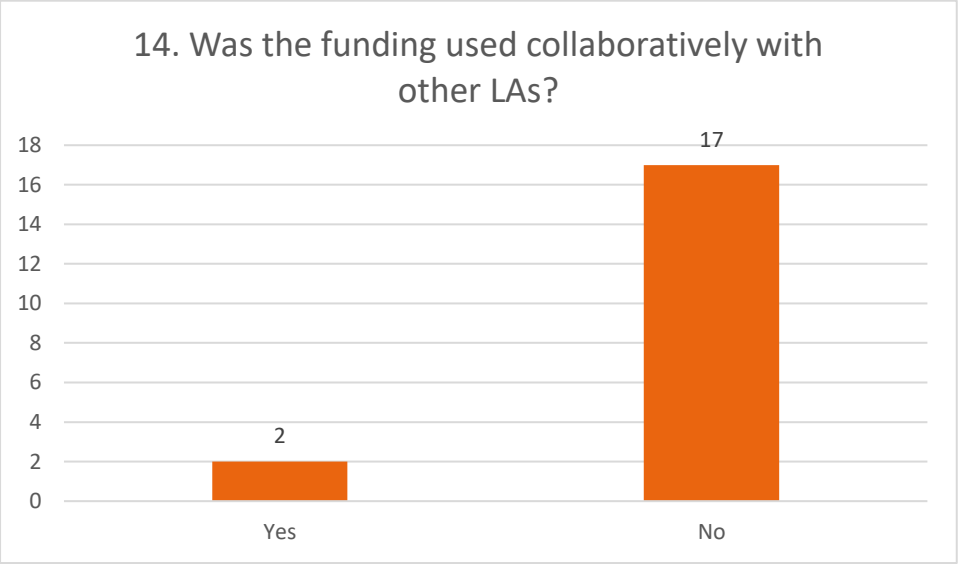
12. To gain an overview of the variety of spending activities across local authorities, please outline/approximate what percentage of your funding has been spent on external staff resources across the following:

Percentage of spend	0-25%	26-50%	51-75%	76-100%	Other
% of spend of CCA Direct Allocation in financial years 2022/23 and 2023/24 (year 1 & 2 of funding)	9	1	0	1	6
% of spend of CCA Direct Allocation in financial year 2024/25 (year 3 of funding)	10	1	0	0	4
% of spend of Case Study in financial year 2023/24 (year 2 of funding)	10	2	0	0	3
% of spend of Case Study in financial years 2024/25 (year 3 of funding)	9	1	0	1	6



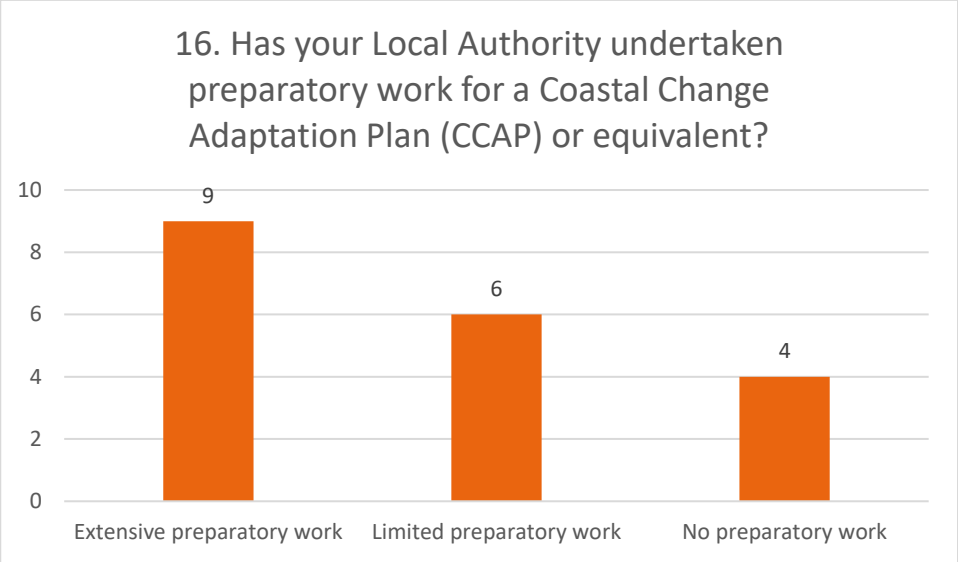
14.Was the funding used collaboratively with other LAs?

Survey response value	Count of survey response
Yes	12
No	7
Grand Total	19



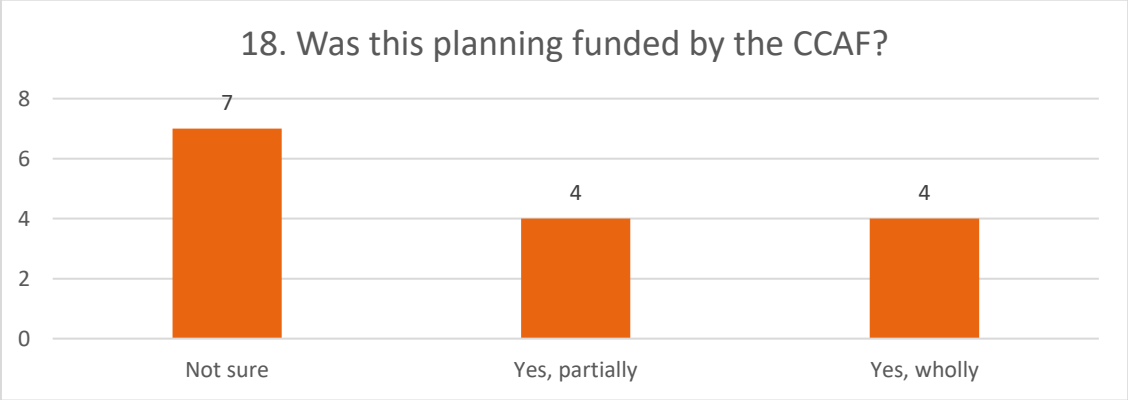
16. Has your Local Authority undertaken preparatory work for a Coastal Change Adaptation Plan (CCAP) or equivalent?

Survey response value	Count of survey response
Extensive preparatory work	9
Limited preparatory work	6
No preparatory work	4
Grand Total	19



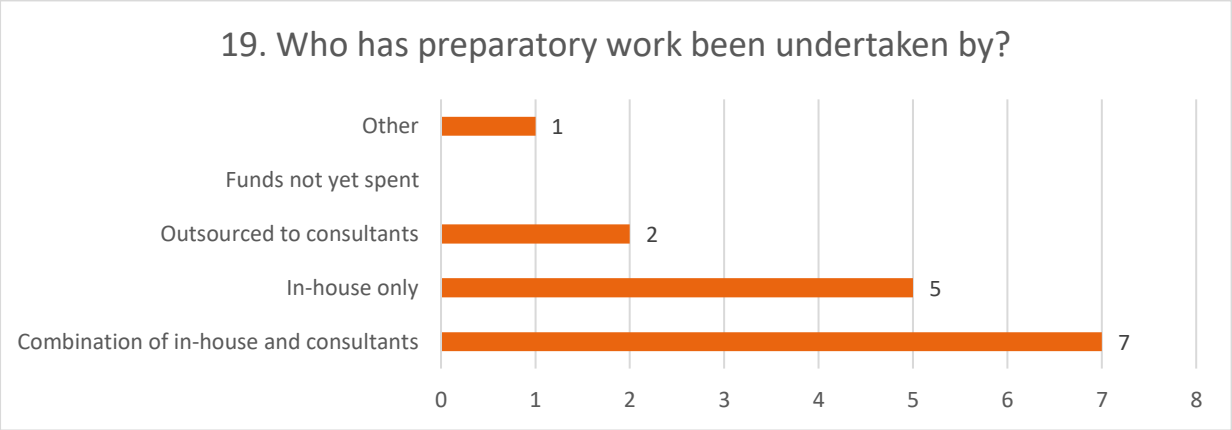
18.Was this planning funded by the CCAF?

Survey response value	Count of survey response
Not sure	7
Yes, partially	4
Yes, wholly	4
Grand Total	15



19. Who has preparatory work been undertaken by?

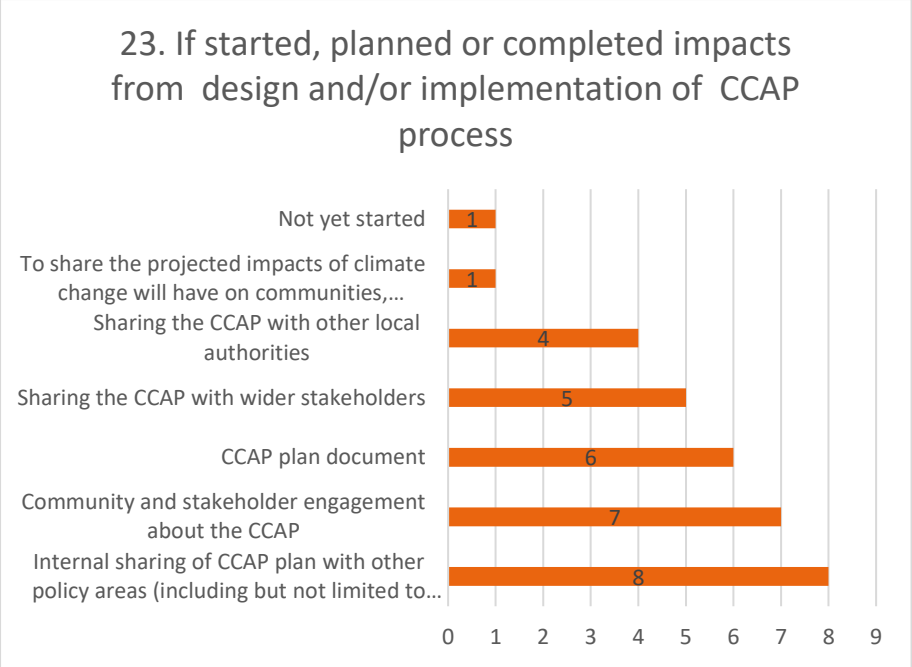
Survey response value	Count of survey response
Combination of in-house and consultants	7
In-house only	5
Outsourced to consultants	2
Funds not yet spent	0
Other	1



Other: “Pre-dates CCAF - if CCAF funding is available to us this may form the funding for a future review of our SMP or creation of a CCAP based on the earlier SMP work"

23. If you have started/completed the CCAP process, please outline the planned or completed impacts from the design and/or implementation of the CCAP process (please select all that apply)

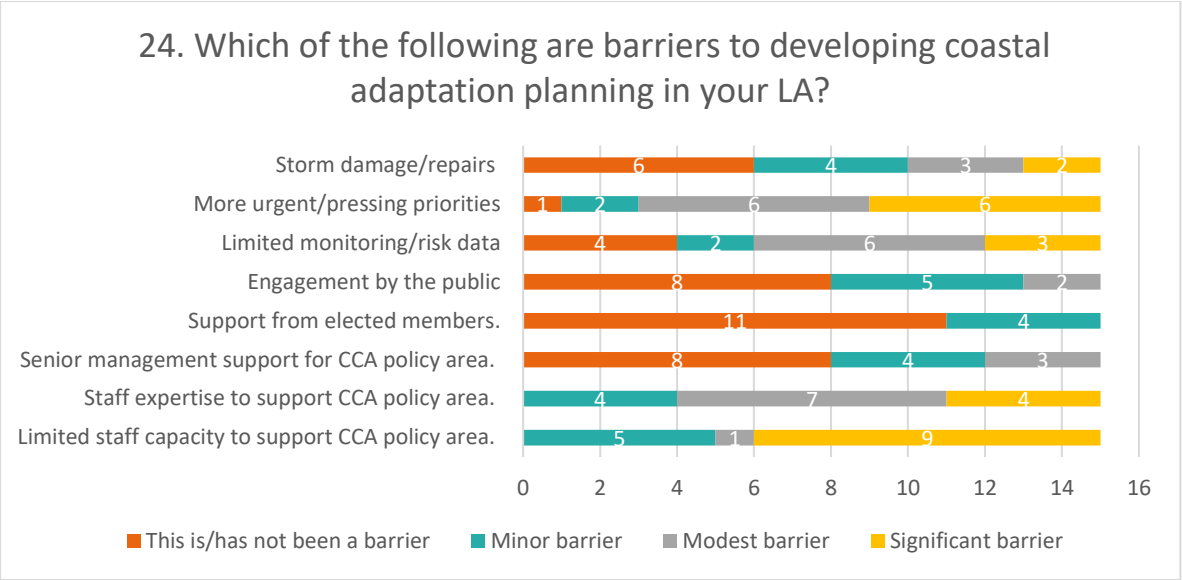
Survey response value	Count of survey response
Internal sharing of CCAP plan with other policy areas (including but not limited to Local Development Plans, Flood Risk Management strategies and plans, etc.,)	8
Community and stakeholder engagement about the CCAP	7
CCAP plan document	6
Sharing the CCAP with wider stakeholders	5
Sharing the CCAP with other local authorities	4
To share the projected impacts of climate change will have on communities, infrastructure and the provision of services.	1
Not yet started	1



24. Which of the following are barriers to DEVELOPING coastal adaptation planning in your local authority? Please note that a later question will be asked about coastal management actions.

Response value	This is/has not been a barrier	Minor barrier	Modest barrier	Significant barrier
Limited staff capacity to support CCA policy area.	0	5	1	9
Staff expertise to support CCA policy area.	0	4	7	4
Senior management support for CCA policy area.	8	4	3	0
Support from elected members.	11	4	0	0
Engagement by the public	8	5	2	0
Limited monitoring/risk data	4	2	6	3
More urgent/pressing priorities	1	2	6	6

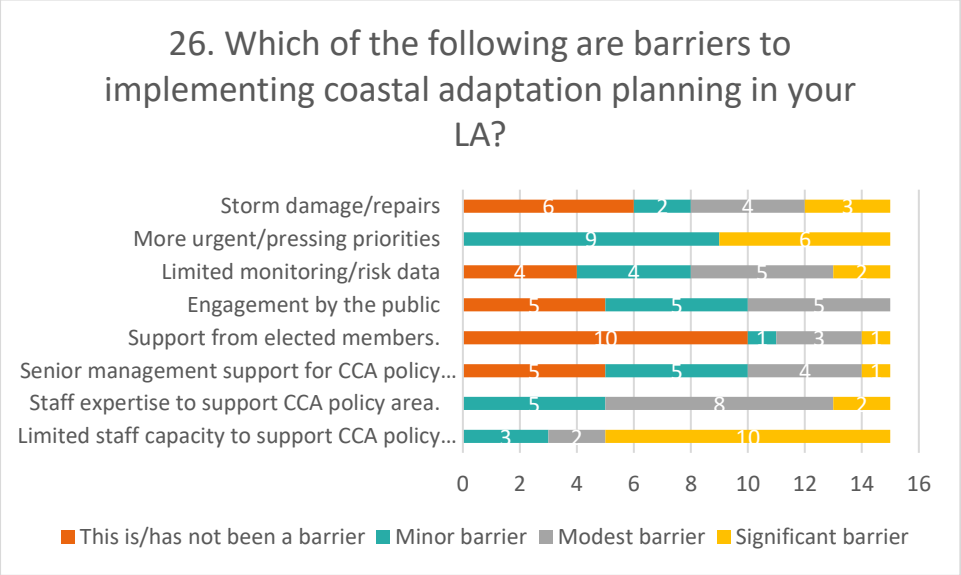
Storm damage/repairs	6	4	3	2



26. Which of the following are barriers to IMPLEMENTING coastal adaptation planning in your local authority? Please note that a later question will be asked about coastal management actions.

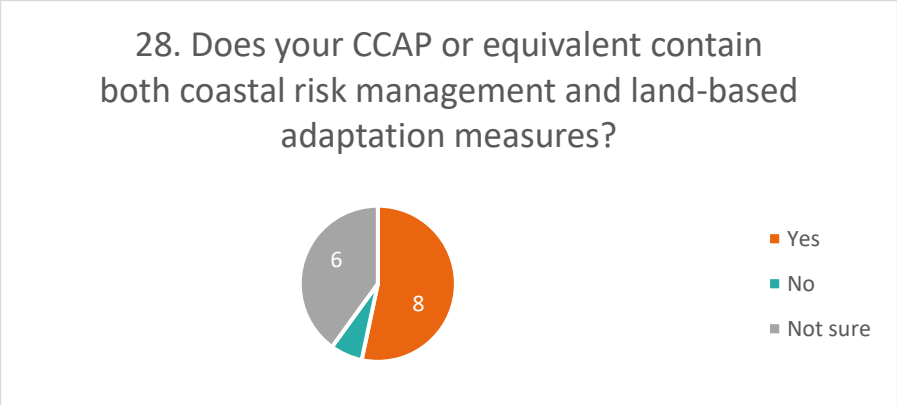
Response value	This is/has not been a barrier	Minor barrier	Modest barrier	Significant barrier
Limited staff capacity to support CCA policy area.	0	3	2	10
Staff expertise to support CCA policy area.	0	5	8	2
Senior management support for CCA policy area.	5	5	4	1
Support from elected members.	10	1	3	1
Engagement by the public	5	5	5	0
Limited monitoring/risk data	4	4	5	2

More urgent/pressing priorities	0	9	0	6
Storm damage/repairs	6	2	4	3



28. Does your CCAP or equivalent contain both coastal risk management (e.g. hard and soft engineering infrastructure and use of nature-based solutions) and land-based adaptation measures (e.g., changing planning policy and/or proactive planning to relocate at risk assets)?

Survey response value	Count of survey response
Yes	8
No	1
Not sure	6
Grand Total	15

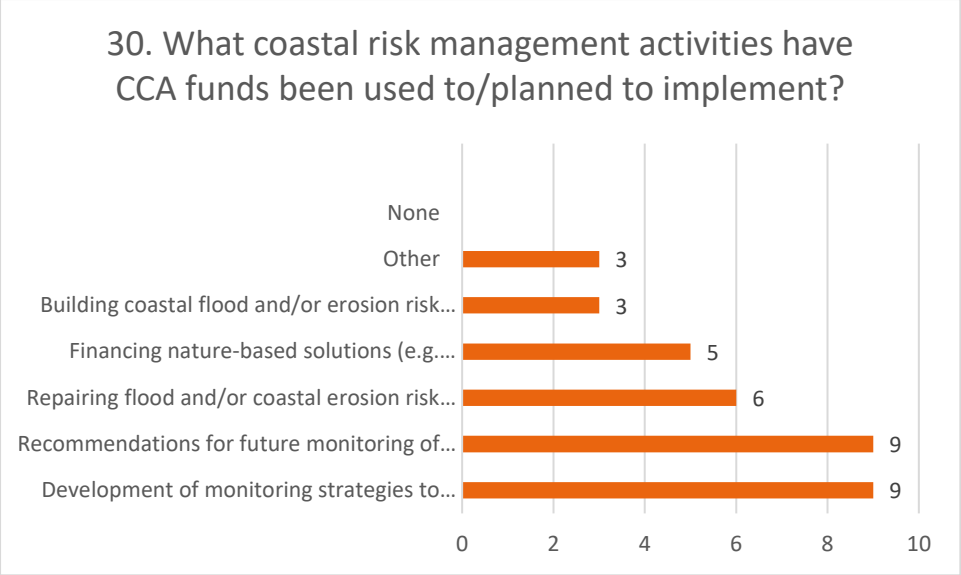


29. Have CCA funds already been used to implement any coastal risk management activities?

Survey response value	Count of survey response
Yes	4
No, but we're planning to	11
Funds have not yet been used in support of CCA policies and remain unclaimed within the council's general capital allocation	4
No, and we have no plans	0
Grand total	19

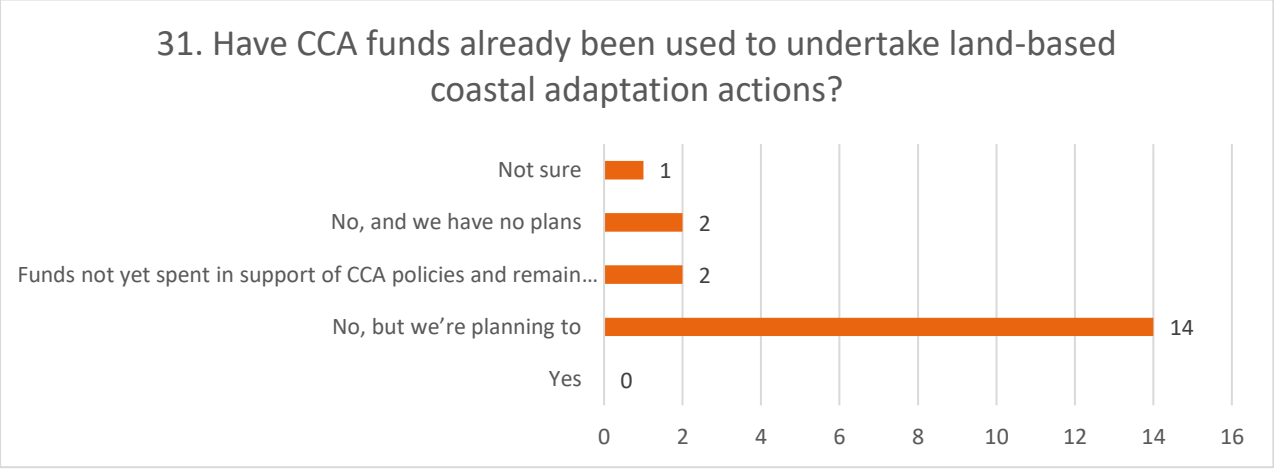
30. What coastal risk management activities have CCA funds been used to/planned to implement?

Survey response value	Count of survey response
Development of monitoring strategies to inform deployment of adaptation actions within CCAP or equivalent	9
Recommendations for future monitoring of coastal change	9
Repairing flood and/or coastal erosion risk alleviation infrastructure	6
Financing nature-based solutions (e.g. dune restoration) to manage coastal change risks	5
Building coastal flood and/or erosion risk alleviation infrastructures	3
Other	3



31. Have CCA funds already been used to undertake land-based coastal adaptation actions?

Survey response value	Count of survey response
Yes	0
No, but we're planning to	14
Funds not yet spent in support of CCA policies and remain unclaimed within the council's general capital allocation	2
No, and we have no plans	2
Not sure	1
Grand Total	19

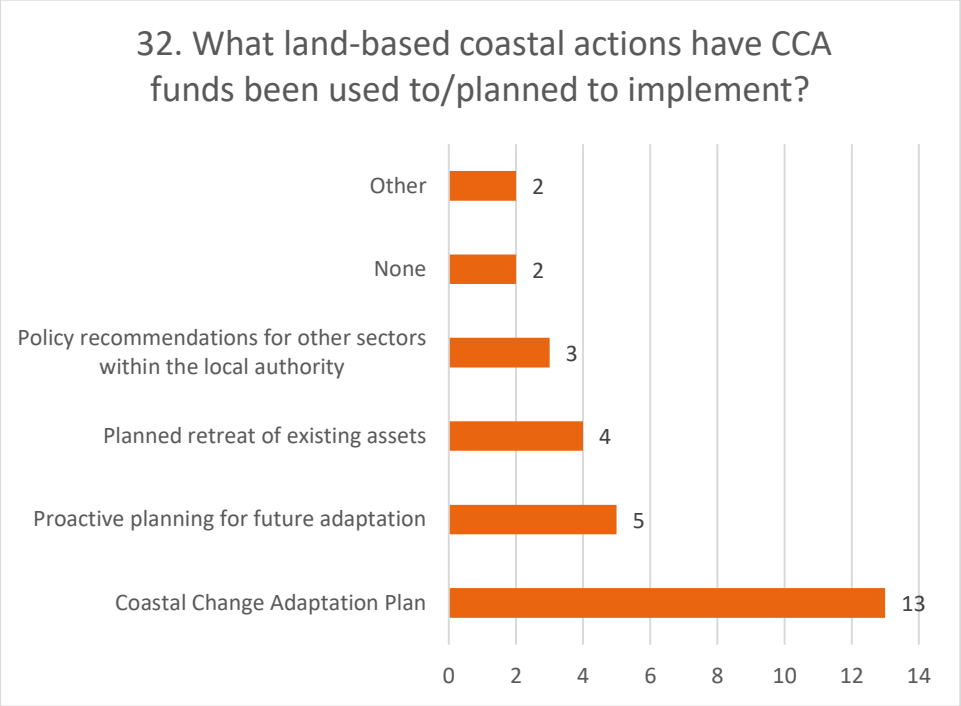


32. What land-based coastal actions have CCA funds been used to/planned to implement? [select all that apply]

Survey response value	Count of survey response
Coastal Change Adaptation Plan	13
Proactive planning for future adaptation	5
Planned retreat of existing assets	4

Policy recommendations for other sectors within the local authority	3
None	2
Other	2

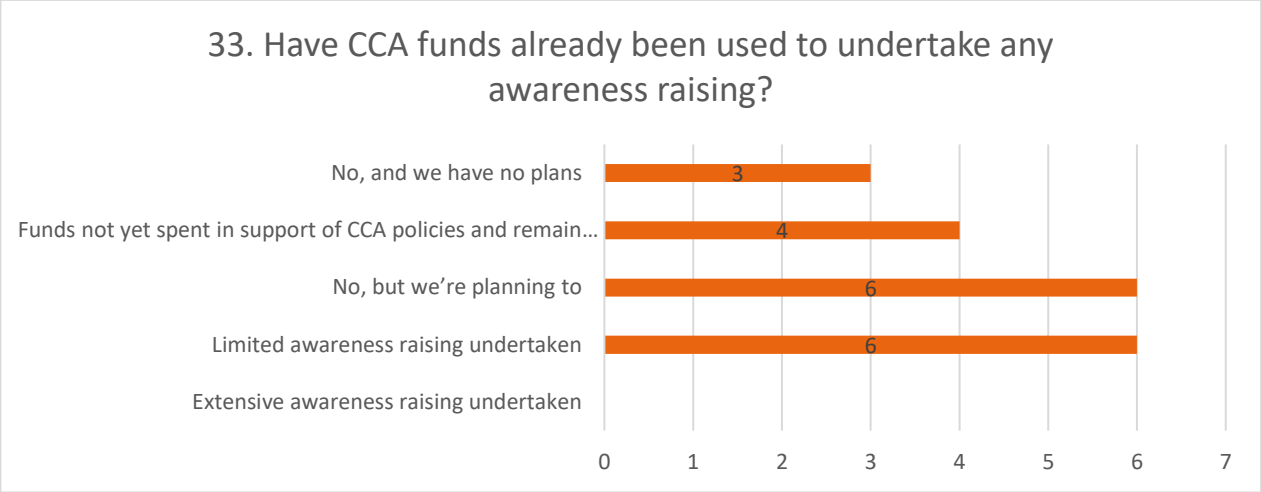
Other: Other: 1. Assessing the potential to encourage dune regeneration; 2. Funding is being used for xxxx area, with project aims to both continue the physical dune restoration works that have been ongoing for over 12yrs, as well as collecting and analysing historical and new data to provide an assessment of the success of the various restoration measures and to predict future changes to the dune. This analysis will be used to develop a new Management Plan to replace the existing one and identify actions based around adopting a dynamic adaptive pathway approach. Funding is also being used for to and update understanding of projected coastal impacts in three Case Study areas. The outputs will inform creation of Council approaches to how we communicate the challenges, and inform Council responses and policies on coastal impacts. Funding is also being used to progress the CCAP, which will identify any future actions from remaining funding.



33.Have CCA funds already been used to undertake any awareness raising on Coastal Change Adaptation for staff, management, elected members and/or the public?

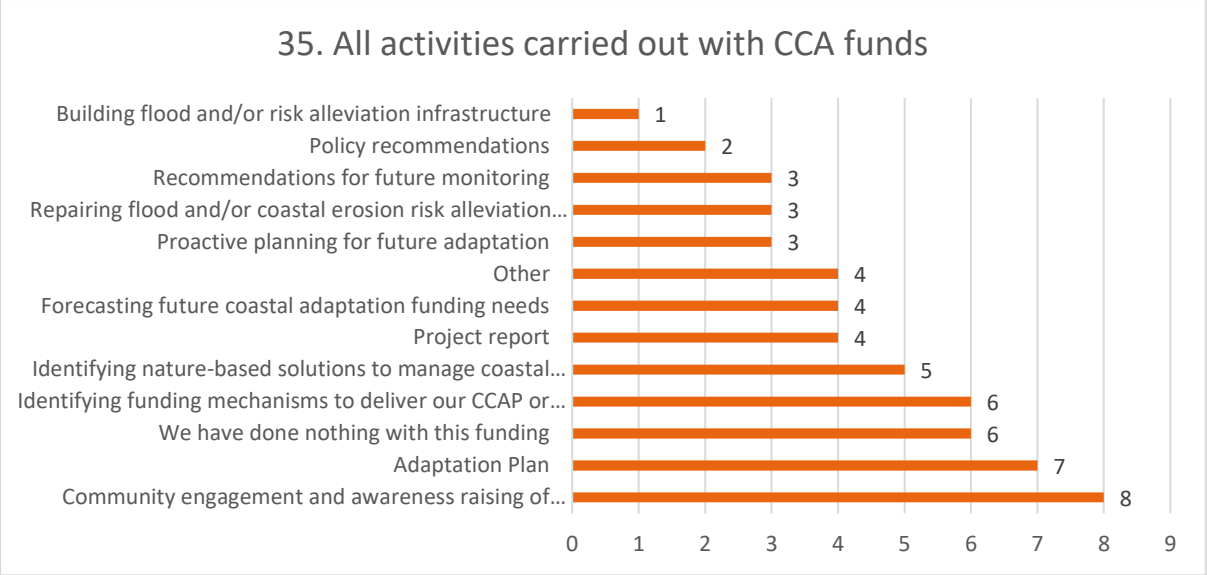
Survey response value	Count of survey response
No, but we're planning to	6
Limited awareness raising undertaken	6
Funds not yet spent in support of CCA policies and remain unclaimed within the council's general capital allocation	4
No, and we have no plans	3

Grand total	19



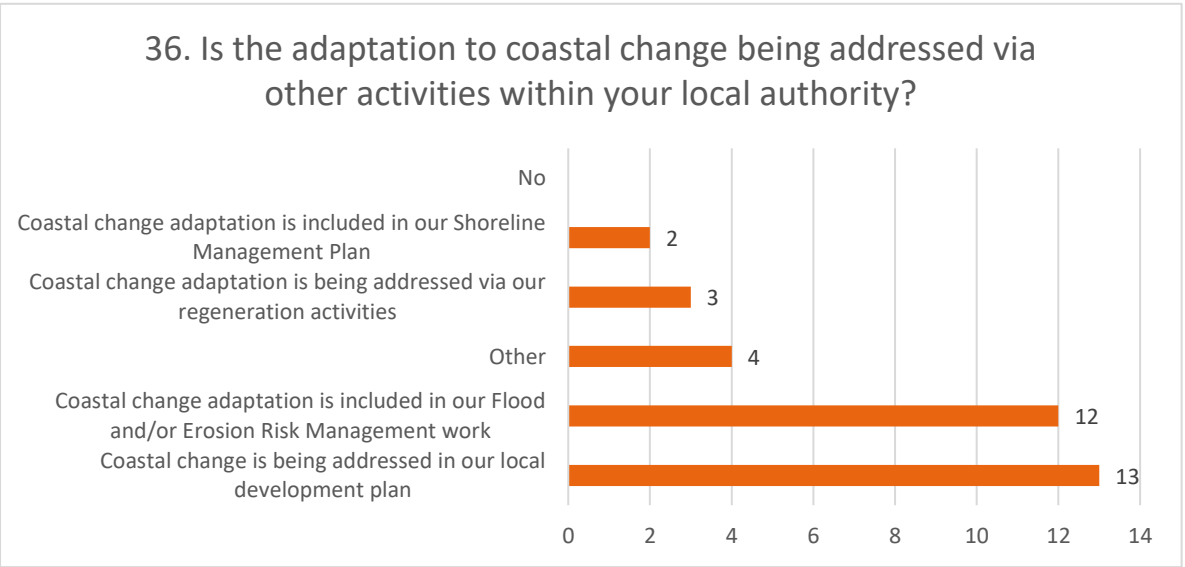
35. Overall, please select all activities carried out with CCA funds (select all that are relevant).

Survey response value	Count of survey response
Community engagement and awareness raising of coastal risks	8
Adaptation Plan	7
We have done nothing with this funding	6
Identifying funding mechanisms to deliver our CCAP or equivalent	6
Identifying nature-based solutions to manage coastal change risks	5
Project report	4
Forecasting future coastal adaptation funding needs	4
Other	4
Proactive planning for future adaptation	3
Repairing flood and/or coastal erosion risk alleviation infrastructure	3
Recommendations for future monitoring	3
Policy recommendations	2
Building flood and/or risk alleviation infrastructure	1
Grand Total	56



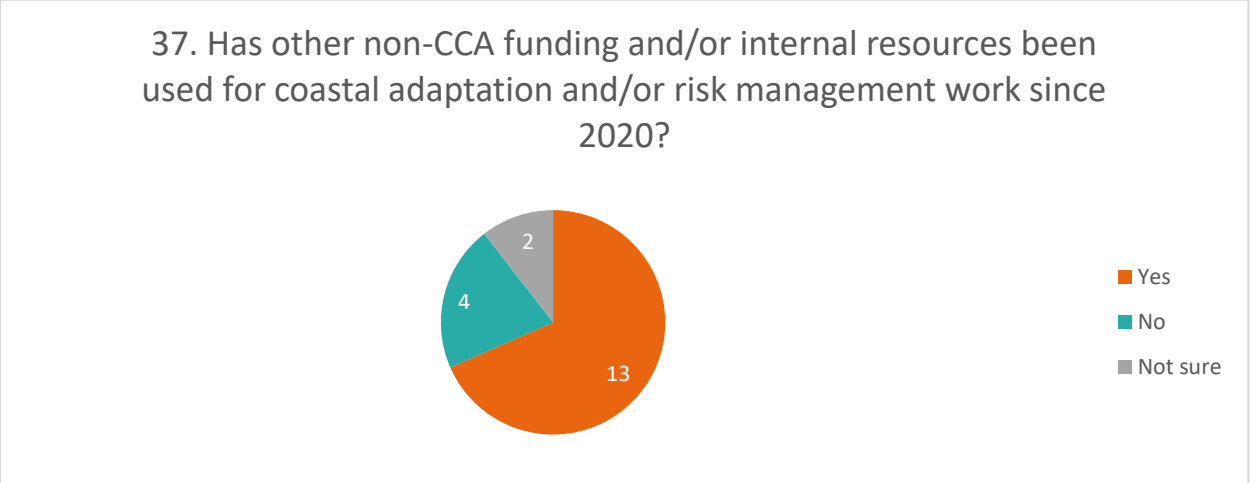
36. Is the adaptation to coastal change being addressed via other activities within your local authority? [select all that apply]

Survey response value	Count of survey response
Coastal change is being addressed in our local development plan	13
Coastal change adaptation is included in our Flood and/or Erosion Risk Management work	12
Other	4
Coastal change adaptation is being addressed via our regeneration activities	3
Coastal change adaptation is included in our Shoreline Management Plan	2
No	0
Grand Total	34



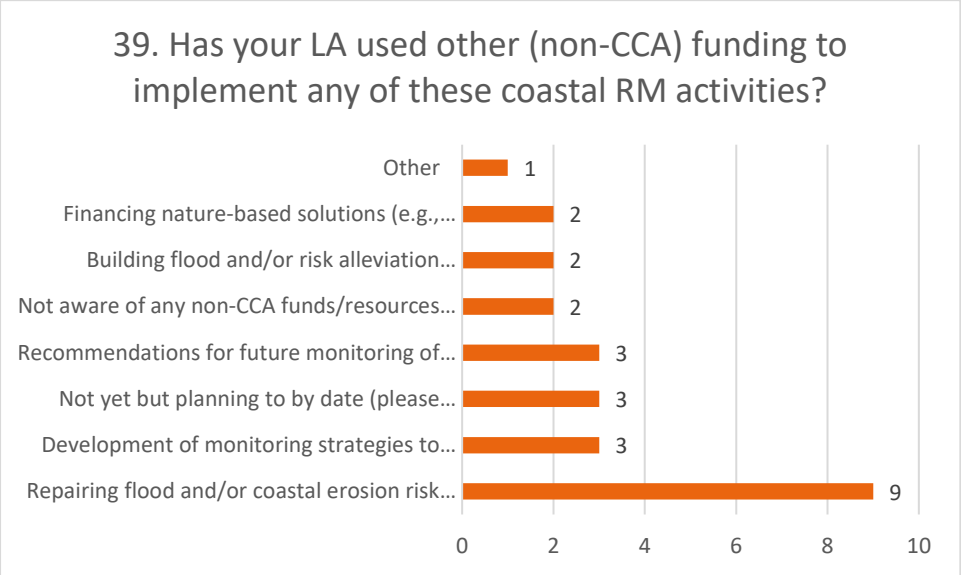
37. Since 2020, has your local authority used funding (other than the CCA Fund) and/or internal resources (e.g., staff time) to help deliver any coastal adaptation and/or coastal risk management work?

Survey response value	Count of survey response
Yes	13
No	4
Not sure	2
Grand Total	19



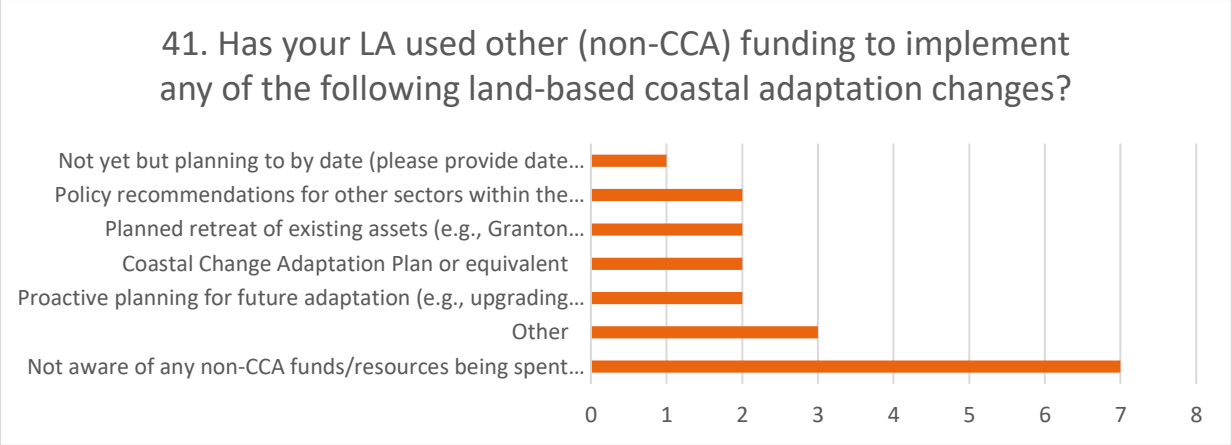
39.Has your local authority used other (non-CCA) funding to implement any of the following land-based coastal adaptation changes? [select all that apply]

Survey response value	Count of survey response
Repairing flood and/or coastal erosion risk alleviation infrastructure	9
Development of monitoring strategies to inform deployment of adaptation actions within CCAP or equivalent	3
Not yet but planning to by date (please provide below)	3
Recommendations for future monitoring of coastal change	3
Not aware of any non-CCA funds/resources being spent on coastal adaptation work	2
Building flood and/or risk alleviation infrastructure	2
Financing nature-based solutions (e.g., dune restoration) to manage coastal change risks	2
Other	1
Grand total	25



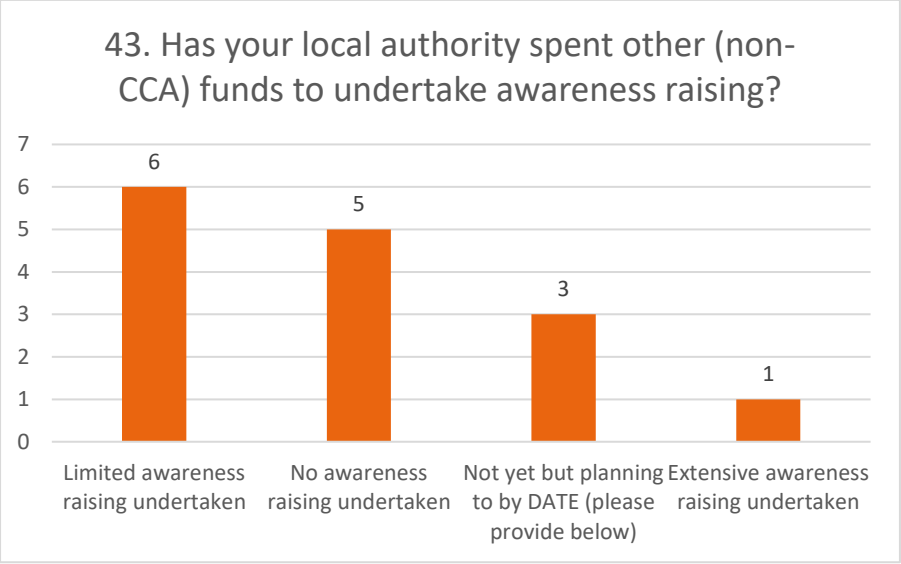
41.Has your local authority spent other (non-CCA) funds to undertake any awareness raising on coastal change and/or coastal change adaptation for staff, management, elected members, and/or the public?

Survey response value	Count of survey response
Not aware of any non-CCA funds/resources being spent on coastal adaptation work	7
Other	3
Proactive planning for future adaptation (e.g., upgrading of an inland road in preparation for future realignment of the coast)	2
Coastal Change Adaptation Plan or equivalent	2
Planned retreat of existing assets (e.g., Granton Waterfront Park in Edinburgh where light industry is being replaced with a park)	2
Policy recommendations for other sectors within the local authority	2
Not yet but planning to by date (please provide date below)	1
Grand total	19



43.Has your local authority spent other (non-CCA) funds to undertake any awareness raising on coastal change and/or coastal change adaptation for staff, management, elected members, and/or the public?

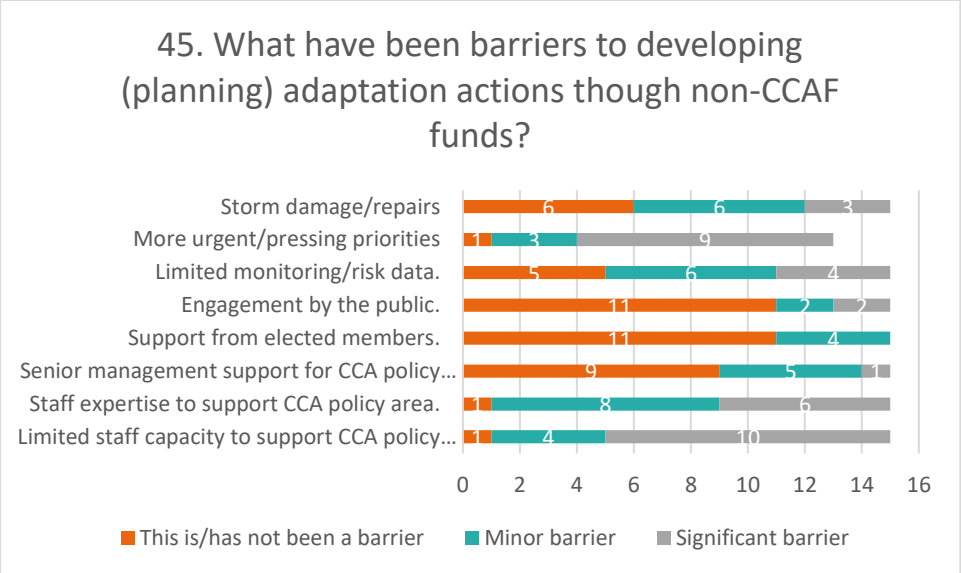
Survey response value	Count of survey response
Limited awareness raising undertaken	6
No awareness raising undertaken	5
Not yet but planning to by DATE (please provide below)	3
Extensive awareness raising undertaken	1
Grand total	15



45. Which of the following are barriers you have experienced in DEVELOPING (planning) adaptation actions in your coastal adaptational work (funded though funds other than the CCAF)?

Response value	This is/has not been a barrier	Minor barrier	Significant barrier

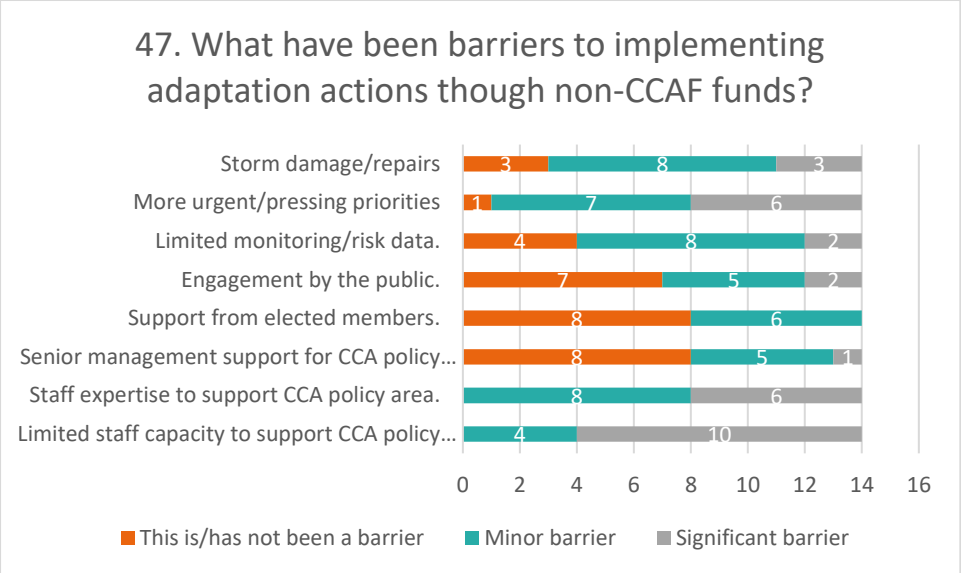
Limited staff capacity to support CCA policy area.	1	4	10
Staff expertise to support CCA policy area.	1	8	6
Senior management support for CCA policy area.	9	5	1
Support from elected members.	11	4	
Engagement by the public.	11	2	2
Limited monitoring/risk data.	5	6	4
More urgent/pressing priorities	1	3	9
Storm damage/repairs	6	6	3



47. Which of the following are barriers you have experienced in IMPLEMENTING adaptation actions in your coastal adaptational work (funded though funds other than the CCAF)?

Response value	This is/has not been a barrier	Minor barrier	Significant barrier

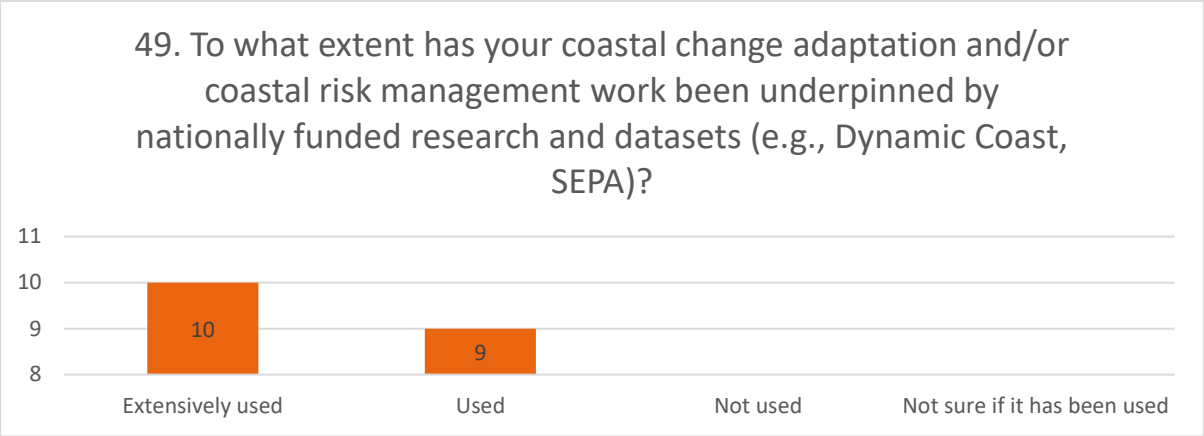
Limited staff capacity to support CCA policy area.	0	4	10
Staff expertise to support CCA policy area.	0	8	6
Senior management support for CCA policy area.	8	5	1
Support from elected members.	8	6	0
Engagement by the public.	7	5	2
Limited monitoring/risk data.	4	8	2
More urgent/pressing priorities	1	7	6
Storm damage/repairs	3	8	3



49. To what extent has your coastal change adaptation and/or coastal risk management work been underpinned by nationally funded research and datasets (e.g., Dynamic Coast for erosion, SEPA flood maps)? Select most relevant only.

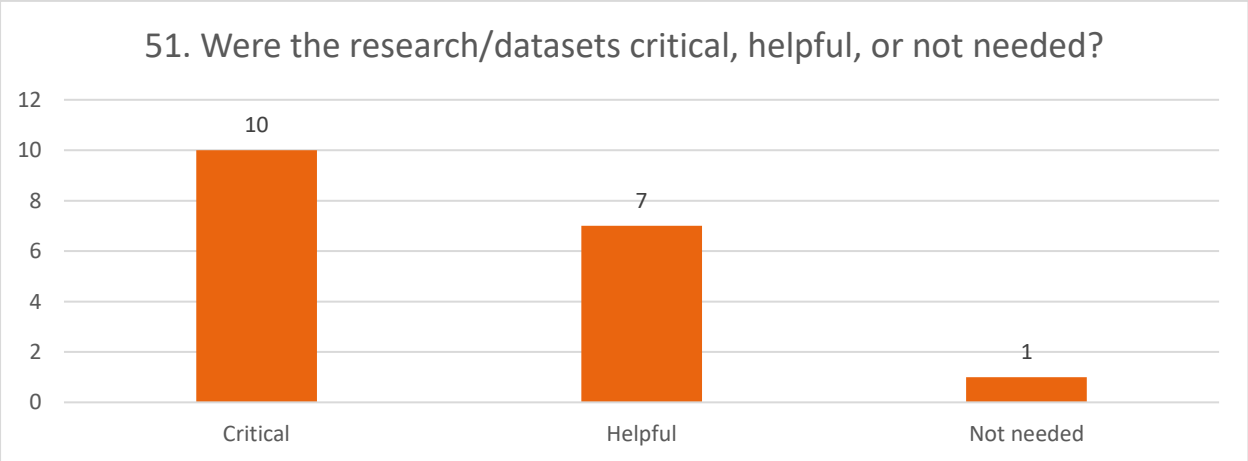
Survey response value	Count of survey response
Extensively used	10

Used	9
Not used	0
Not sure if it has been used	0
Grand total	19



51. Were the research/datasets critical, helpful or not needed... (optional: detail the datasets used in 'other')

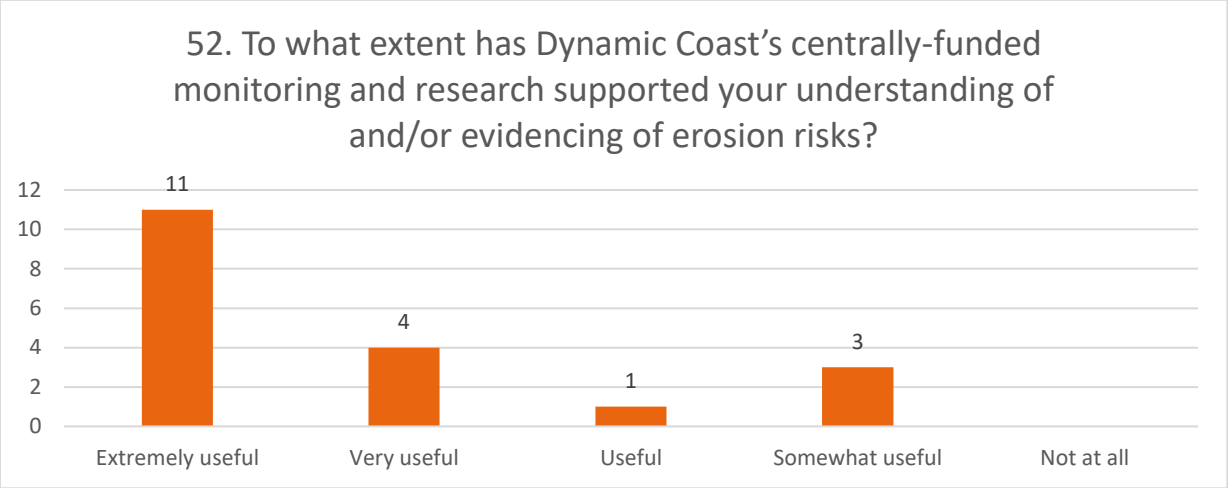
Survey response value	Count of survey response
Critical	10
Helpful	7
Not needed	1
Grand total	18



52.Much of Scotland's CCA work has been informed by Dynamic Coast's centrally funded monitoring and research. How much has this supported your understanding of and/or evidencing erosion risks? Select most relevant only.

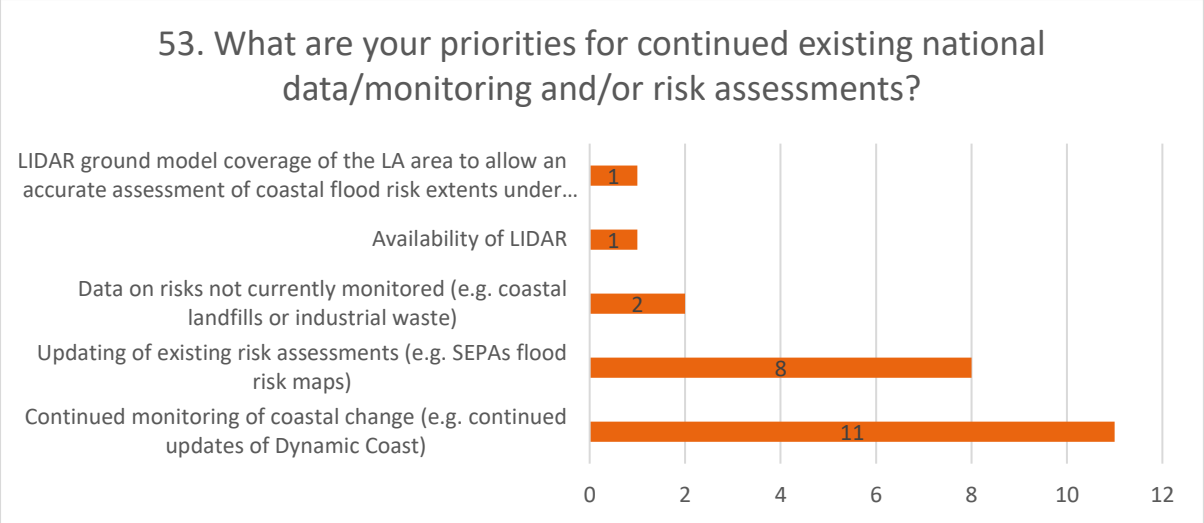
Survey response value	Count of survey response
Extremely useful	11

Very useful	4
Useful	1
Somewhat useful	3
Not at all	0
Grand total	19



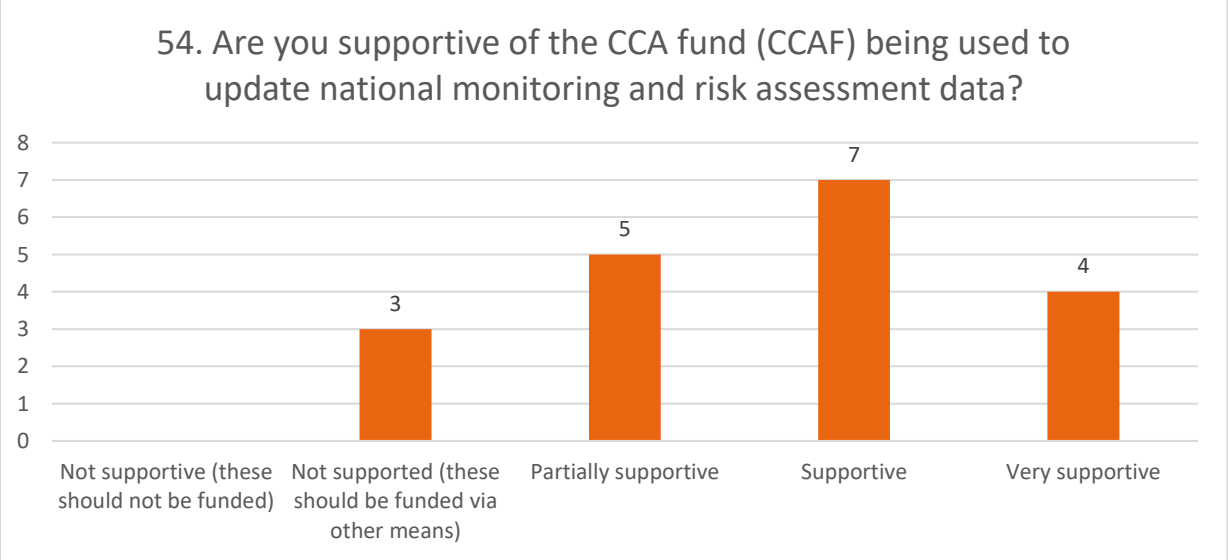
53. What are your priorities for continued existing National data/monitoring and/or risk assessments?

Survey response value	Count of survey response
Continued monitoring of coastal change (e.g. continued updates of Dynamic Coast)	11
Updating of existing risk assessments (e.g. SEPAs flood risk maps)	8
Data on risks not currently monitored (e.g. coastal landfills or industrial waste)	2
Availability of LIDAR	1
LIDAR ground model coverage of the LA area to allow an accurate assessment of coastal flood risk extents under the different CCAP sea level rises.	1
Grand Total	23



54.Are you supportive of the CCA fund (CCAF) being used to update National monitoring and risk assessment data?

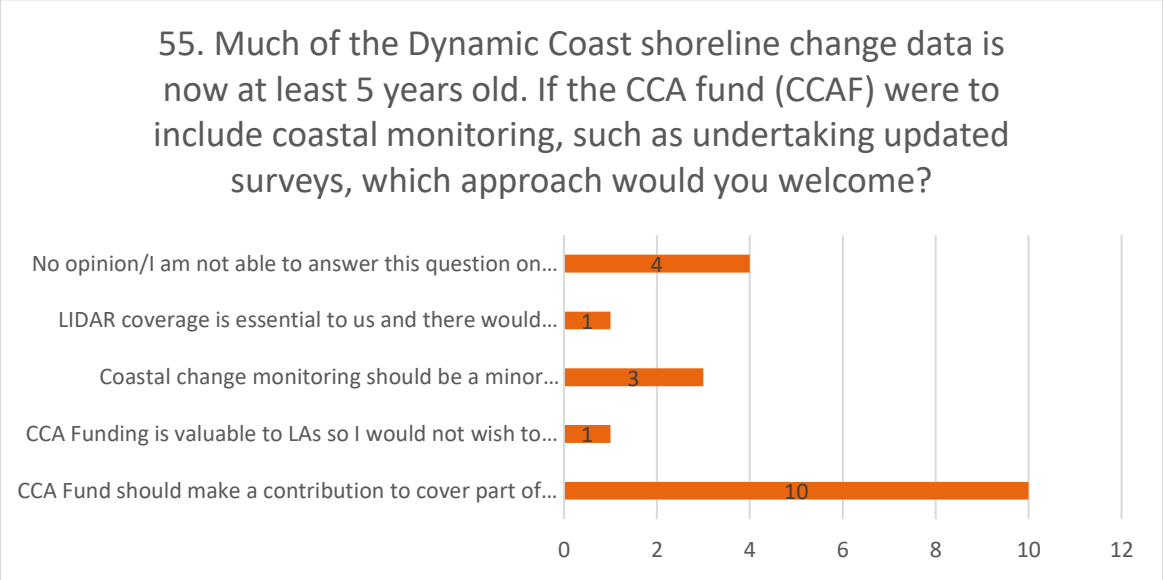
Survey response value	Count of survey response
Not supportive (these should not be funded)	0
Not supported (these should be funded via other means)	3
Partially supportive	5
Supportive	7
Very supportive	4
Grand total	19



55. Much of the Dynamic Coast shoreline change data is now at least 5 years old. The urgency and importance of monitoring coastal change (and therefore undertaking surveys) was recently underlined by the Committee on Climate Change. If the CCA fund (CCAF) were

to include coastal monitoring, such as undertaking updated surveys, which approach would you welcome? Please select one option.

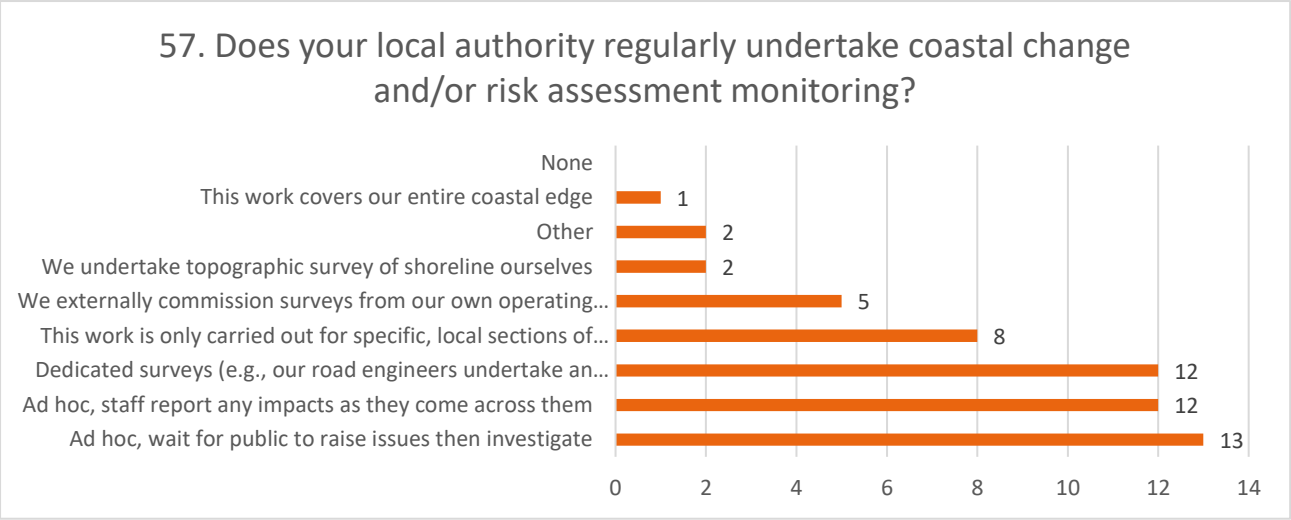
Survey response value	Count of survey response
CCA Fund should make a contribution to cover part of the costs of coastal change monitoring, but central funding from Scottish Government should also be used	10
CCA Funding is valuable to LAs so I would not wish to the number or value of awards. I would rather Coastal monitoring was wholly funded elsewhere. However, coastal monitoring can be costly and monitoring by individual LAs will be inefficient compared to a single national programme.	1
Coastal change monitoring should be a minor component of the CCA funds allocation	3
LIDAR coverage is essential to us and there would appear to be overlaps in Dynamic Coast update work and our own needs.	1
No opinion/I am not able to answer this question on behalf of my local authority	4
Grand Total	19



57. Does your local authority regularly undertake coastal change and/or risk assessment monitoring? Select all that are relevant:

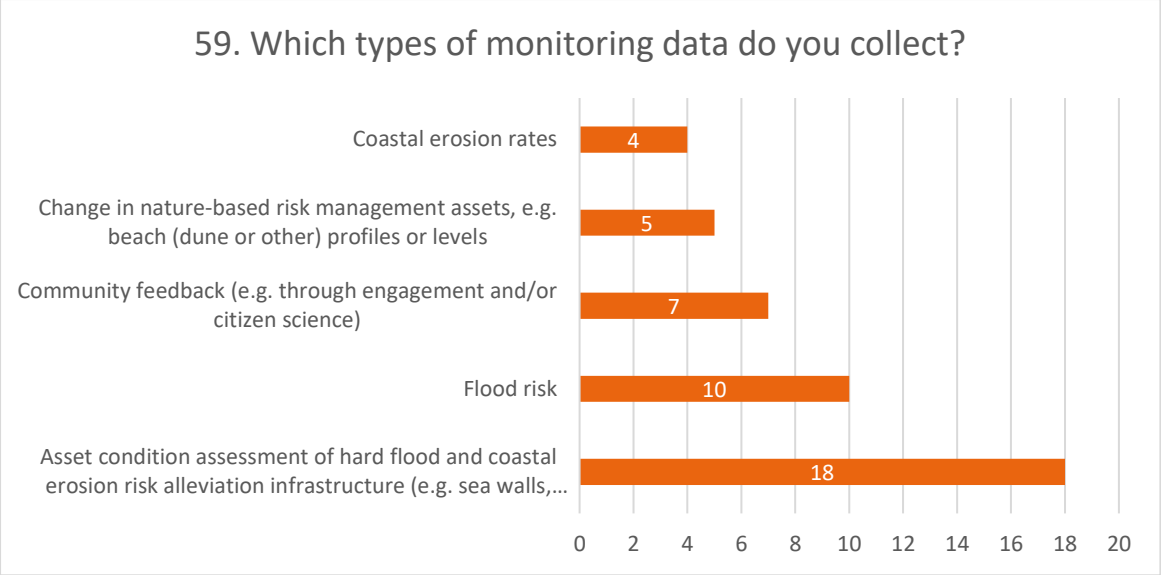
Survey response value	Count of survey response
Ad hoc, wait for public to raise issues then investigate	13
Ad hoc, staff report any impacts as they come across them	12

Dedicated surveys (e.g., our road engineers undertake an asset inspection of council owned assets periodically/after storms etc.)	12
This work is only carried out for specific, local sections of coast	8
We externally commission surveys from our own operating budget	5
We undertake topographic survey of shoreline ourselves	2
Other	2
This work covers our entire coastal edge	1
None	0
Grand total	55



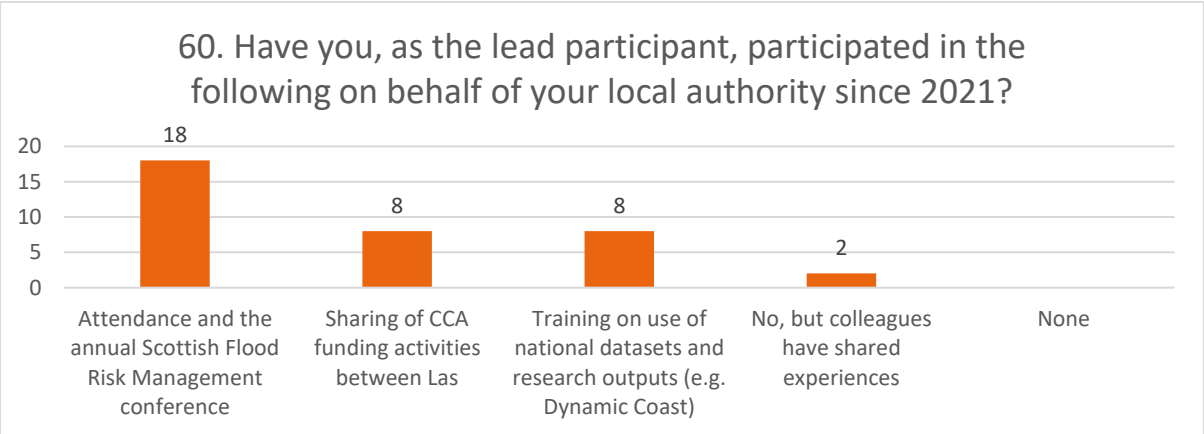
59. Which types of monitoring data do you collect? Select all that apply:

Survey response value	Count of survey response
Asset condition assessment of hard flood and coastal erosion risk alleviation infrastructure (e.g. sea walls, groynes, dunes)	18
Flood risk	10
Community feedback (e.g. through engagement and/or citizen science)	7
Change in nature-based risk management assets, e.g. beach (dune or other) profiles or levels	5
Coastal erosion rates	4
Grand Total	44



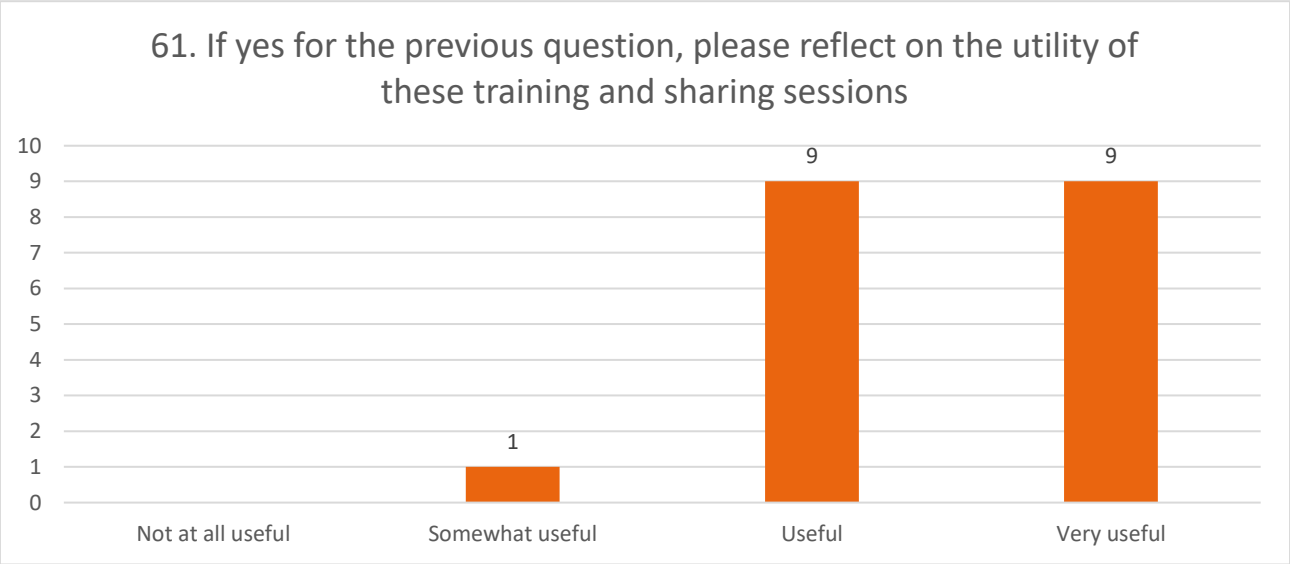
60.Have you, as the lead participant, participated in the following on behalf of your local authority since 2021 (select all that apply)?

Survey response value	Count of survey response
Attendance and the annual Scottish Flood Risk Management conference	18
Sharing of CCA funding activities between Las	8
Training on use of national datasets and research outputs (e.g. Dynamic Coast)	8
No, but colleagues have shared experiences	2
None	0
Grand total	36



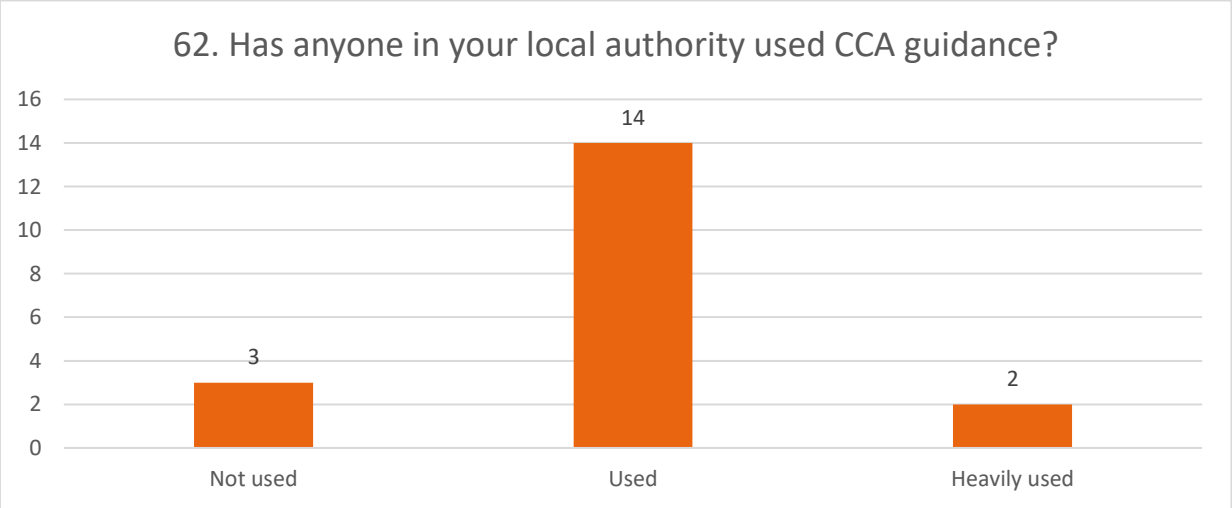
61.If yes for the previous question, please reflect on the utility of these training and sharing sessions.

Survey response value	Count of survey response
Not at all useful	0
Somewhat useful	1
Useful	9
Very useful	9
Grand total	19



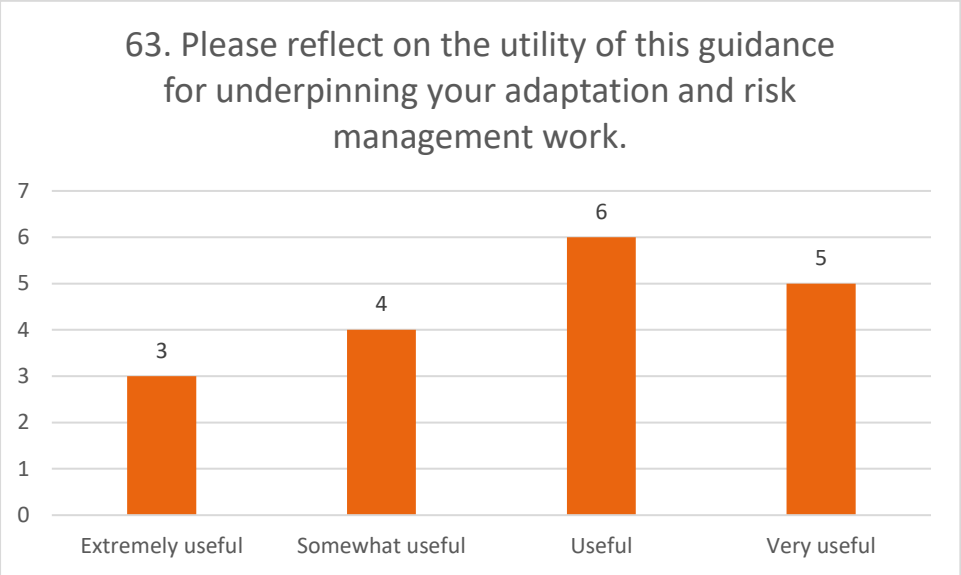
62.Has anyone in your local authority used CCA guidance?

Survey response value	Count of survey response
Heavily used	2
Not used	3
Used	14
Grand total	19



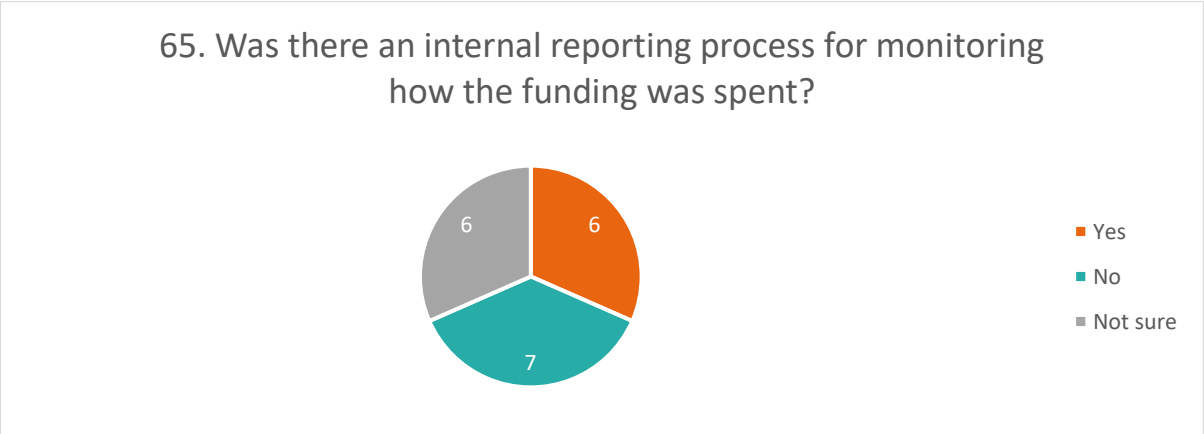
63. Please reflect on the utility of this guidance for underpinning your adaptation and risk management work.

Survey response value	Count of survey response
Extremely useful	3
Somewhat useful	4
Useful	6
Very useful	5
Grand Total	18



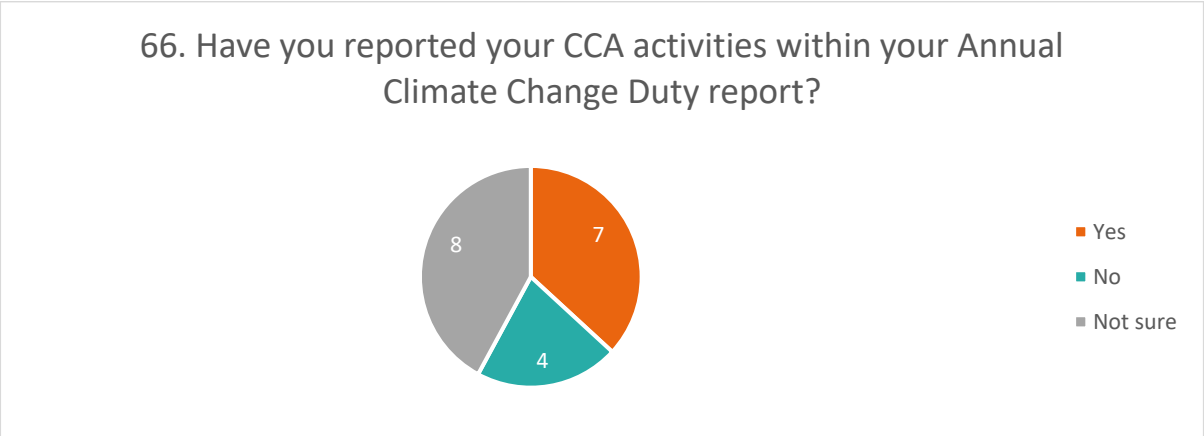
65.Was there an internal reporting process for monitoring how the funding was spent?

Survey response value	Count of survey response
Yes	6
No	7
Not sure	6
Grand total	19



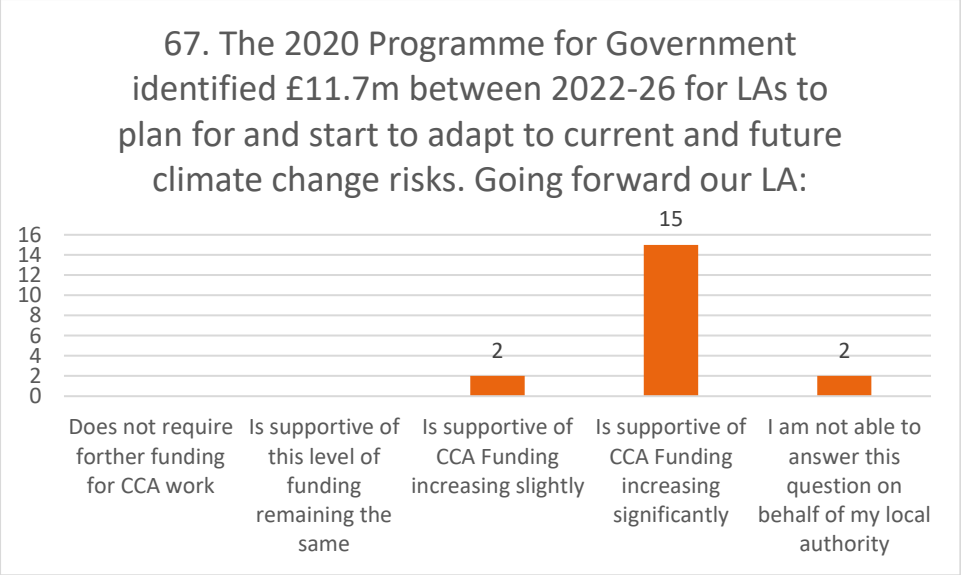
66.Have you reported your CCA activities within your Annual Climate Change Duty report?

Survey response value	Count of survey response
Yes	7
No	4
Not sure	8
Grand total	19



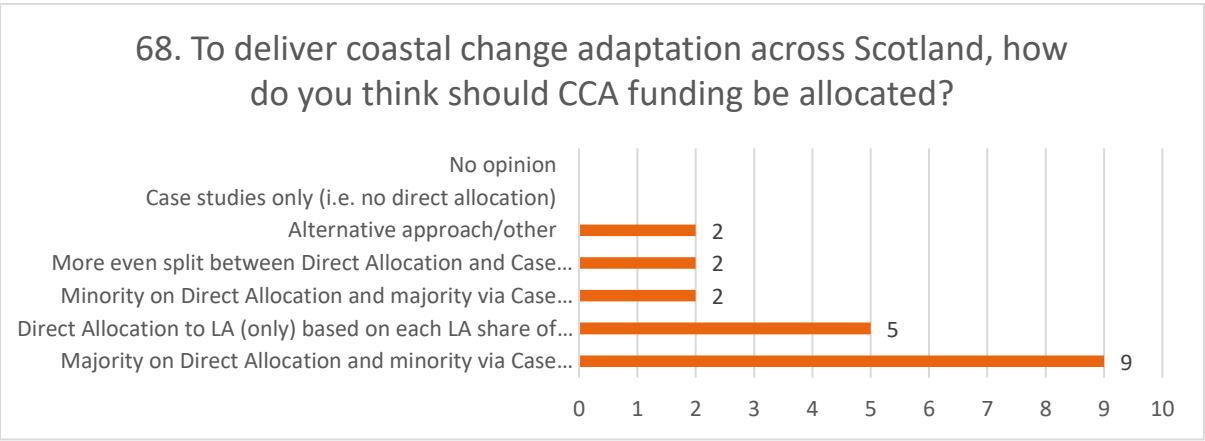
67. The 2020 Programme for Government identified £11.7m between 2022-26 (incl. £5m in 2025/26) for local authorities to plan for and start to adapt to ensure we are ready to adapt to current and future climate change risks. Going forward our LA (select the most relevant):

Survey response value	Count of survey response
Does not require further funding for CCA work	0
Is supportive of this level of funding remaining the same	0
Is supportive of CCA Funding increasing slightly	2
Is supportive of CCA Funding increasing significantly	15
I am not able to answer this question on behalf of my local authority	2
Grand Total	19



68. To deliver coastal change adaptation across Scotland, how do you think should CCA funding be allocated? Select all that apply.

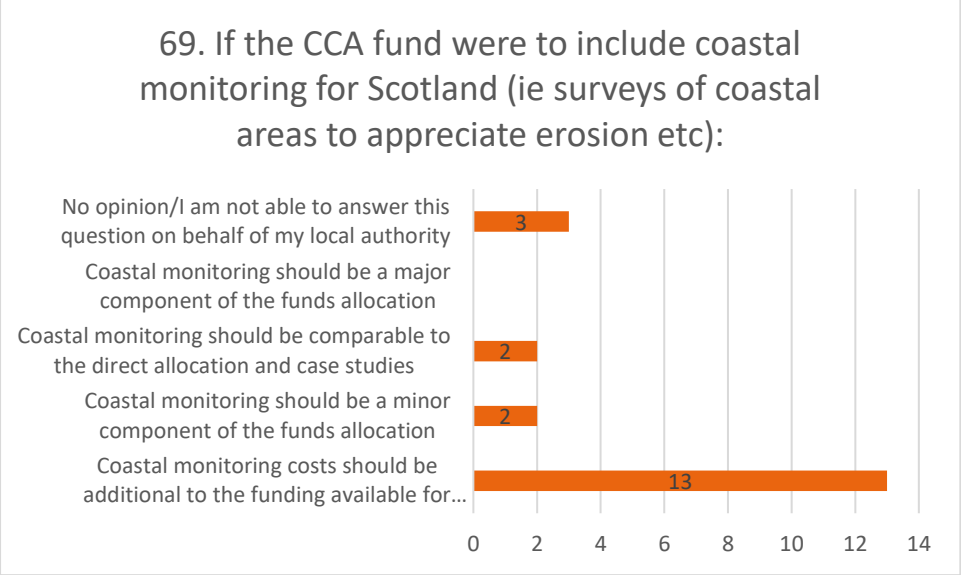
Survey response value	Count of survey response
Majority on Direct Allocation and minority via Case Studies (i.e., the recent approach)	9
Direct Allocation to LA (only) based on each LA share of Scotland's erosion risks (i.e., recentapproach but without Case Studies)	5
Minority on Direct Allocation and majority via Case Studies	2
More even split between Direct Allocation and Case Studies	2
Alternative approach/other	2
Case studies only (i.e. no direct allocation)	0
No opinion	0



69. If the CCA fund were to include coastal monitoring for Scotland (ie surveys of coastal areas to appreciate erosion etc). Please select all that apply:

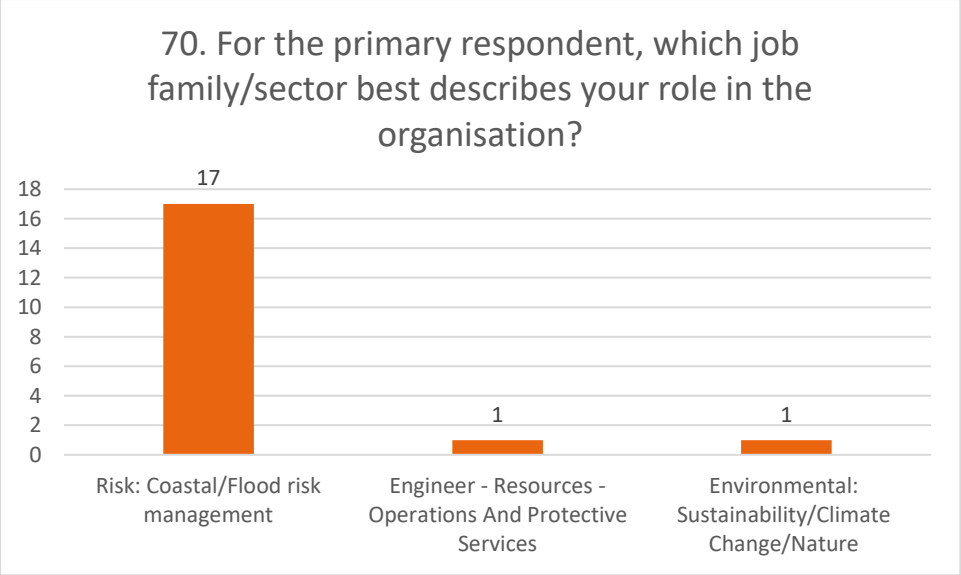
Survey response value	Count of survey response

Coastal monitoring costs should be additional to the funding available for adaptation	13
Coastal monitoring should be a minor component of the funds allocation	2
Coastal monitoring should be comparable to the direct allocation and case studies	2
Coastal monitoring should be a major component of the funds allocation	0
No opinion/I am not able to answer this question on behalf of my local authority	3



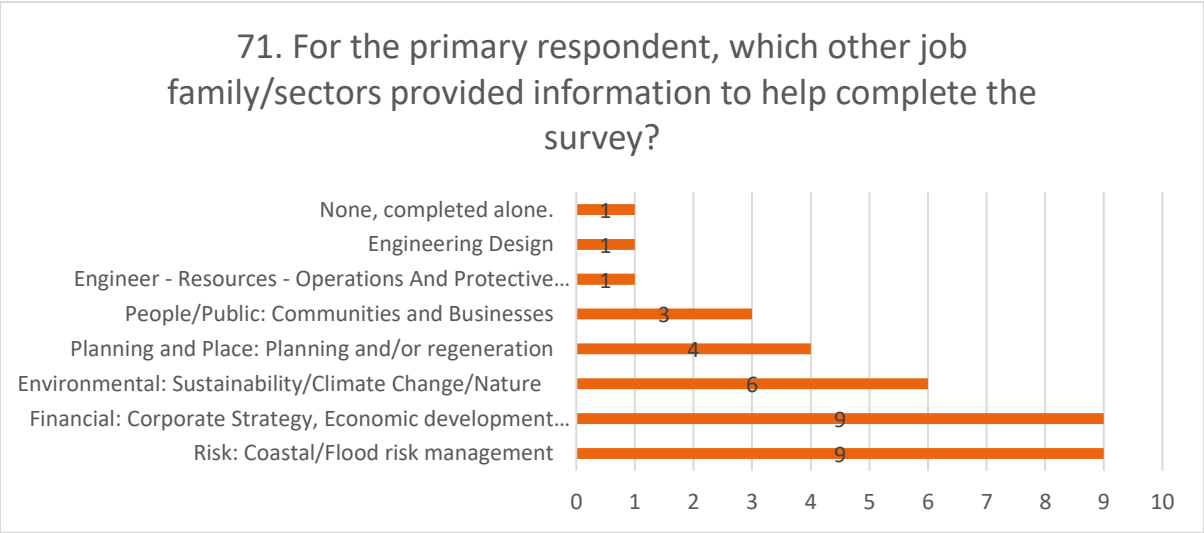
70. For the primary respondent, which job family/sector best describes your role in the organisation? (select the most relevant one only):

Survey response value	Count of survey response
Risk: Coastal/Flood risk management	17
Engineer - Resources - Operations And Protective Services	1
Environmental: Sustainability/Climate Change/Nature	1
Grand Total	19



71. For the primary respondent, which other job family/sectors provided information to help complete the survey (select all that are relevant):

Survey response value	Count of survey response
Risk: Coastal/Flood risk management	9
Financial: Corporate Strategy, Economic development or Finance	9
Environmental: Sustainability/Climate Change/Nature	1
Planning and Place: Planning and/or regeneration	4
People/Public: Communities and Businesses	3
Engineer - Resources - Operations And Protective Services	1
Engineering Design	1
None, completed alone.	1



Appendix D Interview questions

Coastal Climate Change Adaptation – Are we Prepared? Interview questions

Section 1: Adaptation awareness
Q1. Tell me briefly about the need for coastal adaptation in your area.

Q2. For those with non-coastal work responsibilities (e.g., housing, development plans, infrastructure)
Which job family best describes your role – risk, financial, planning and place, environmental, or people/public?
Can you describe how coastal erosion and flooding affect communities in your region?
Do you see coastal erosion and flood risk as something that affects the activities of your department/is part of your remit?
Do policies you work with in your remit explicitly refer to the coast or coastal climate change risks?
OR
Q2. For those with coastal work responsibilities (e.g., coastal risk, adaptation)
What job family best describes your role – risk, financial, planning and place, environmental, or people/public?
Who (i.e. which teams) within your local authority do you work with on coastal erosion and flood risk?

Section 2: Scottish Government Coastal Change Adaptation (CCA) funding awareness and spend to date
Q3. What has your local authority's experience been engaging with the two funding streams in the CCA fund? (e.g. direct allocation and case studies)
Q4. (If experience of the Case Study funding stream) Was this more helpful in terms of the challenges your local authority is facing?
Q5. Which council teams were involved in preparing the funding bids (e.g. for the direct allocation funding stream)?
Q6. At what level (i.e. which role internally) was approval given for your team's participation in the funding bid?
Q7. Did you roll over money that came in for any previous year? If yes, how helpful was this?
Q8. Which teams in the council were involved in spending the money?
Q9. What has CCA money been spent on?
Q10. Was funding used collaboratively with other local authorities?
Q11. Has your local authority forecast future coastal adaptation funding needs, and if so, how?
Q12. What do you think of the CCA guidance produced by the Scottish Government?

Section 3: Participation in CCA planning activities
Q13. Has your local authority produced a Coastal Change Adaptation Plan (CCAP)?
If yes, which teams were involved?
What guidance and/or data did you rely on?
What particular challenges were you trying to address?
What do you intend to spend the money on?

Q14. If no, is your local authority undertaking preparatory work for a Coastal Change Adaptation Plan (CCAP) or equivalent?
Q15. If you have a CCAP, is there a monitoring plan for this, in terms of intended outcomes?
Q16. These outcomes are meant to produce a change (i.e. impact) in how an issue is addressed. For example, an impact can often be seen in a before/after comparison, such as greater awareness after scheduled meetings. Are you monitoring impacts?
Q17. Are there any unintended impacts you have seen emerge from CCAP activities?
Q18. In your experience, what has been the biggest challenge to carrying out the CCAP and why? How has your local authority responded to this?

Section 4: Use of evidence, guidance and training to support the assessment of coastal change risks and adaptation planning processes
Q19 How do you keep your knowledge of coastal challenges up to date?
Q20. How much do you engage with national research and datasets such as Dynamic Coast in your work?

Section 5: Lessons for future adaptation action, funding allocations and guidance from the Scottish Government
Q21. What would you like to see from future CCA funding allocations?
Q22. For tackling complex environmental challenges along your local authority's coast, do you think the CCA programme has been effective?
Q23. What more could the Scottish Government be doing to support coastal adaptation delivery at a local level?
Q24. Is there anything we haven't talked about that you think is important?

Appendix E Focus group topics

Focus group questions

Theme 1. Knowledge and evidence
Main question: what evidence would help you have more complete knowledge of coastal change in your local authority area?
Additional questions or prompts:
How much of your local authority area is Dynamic Coast relevant for?
What are the limits of Dynamic Coast?
(Referring to the 2023 Scottish Government Coastal Change Adaptation Plan Guidance document)
What would support you in the delivery of an adaptive pathways approach? *(e.g. further knowledge/ training)*

Theme 2. Planning
Main question: Do you feel that your local authority's current planning processes impede coastal adaptation work? *(if so, how?)*
Additional questions or prompts:
(e.g. challenges of land ownership, allocating immediate coastal strip for adaptive use, adaptation requirements in National Planning Framework 4, risk of maladaptation because of planning policy?, general about planning policy and delivery

Theme 3. Community and stakeholder engagement
Main question: How could local delivery of adaptation through community groups, statutory agencies, or other stakeholders work?
Additional questions or prompts:
(how does stakeholder/statutory agency remits/requirements affect local delivery/what can be done so that local authorities can delegate adaptation work at a local level to other actors, where relevant?)

Theme 4. Constraints of funding
Main question: How can you foresee funding as supporting anticipatory adaptation (i.e. preparing for future coastal risk)?
Additional questions or prompts:
How can we use funding windows to do long-term adaptation planning and long-term implementation? Data collected from study so far suggests a lot of the spend has been on here and now. (i.e. could we potentially ringfence funding for strategic planning/ could the money be spent on a person/resource)
What are the constraints of the money from the CCA fund, what they (local authorities) can/can't spend the money on? E.g. can they (local authorities) pool money together other sources.
By how much/by how many years can they rollover?

Theme 5. Organisational capacity, structure and governance

Main question: What is working and what is not working with regards to allocation of money for coastal adaptation?
Additional questions or prompts:
Aim of this theme is to be able to eventually map models of good practice of organisational structure – in finance and implementation.

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