

TECHNICAL NOTE

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2023s0200
Eastbourne Strategic Flood Risk Assessment
Eastbourne Borough Council
April 2024
Peter Rook BSc MSc MCIWEM C.WEM FGS
Alastair Dale BSc PGDip MIAHR
Coastal Resilience and Adaptation Areas

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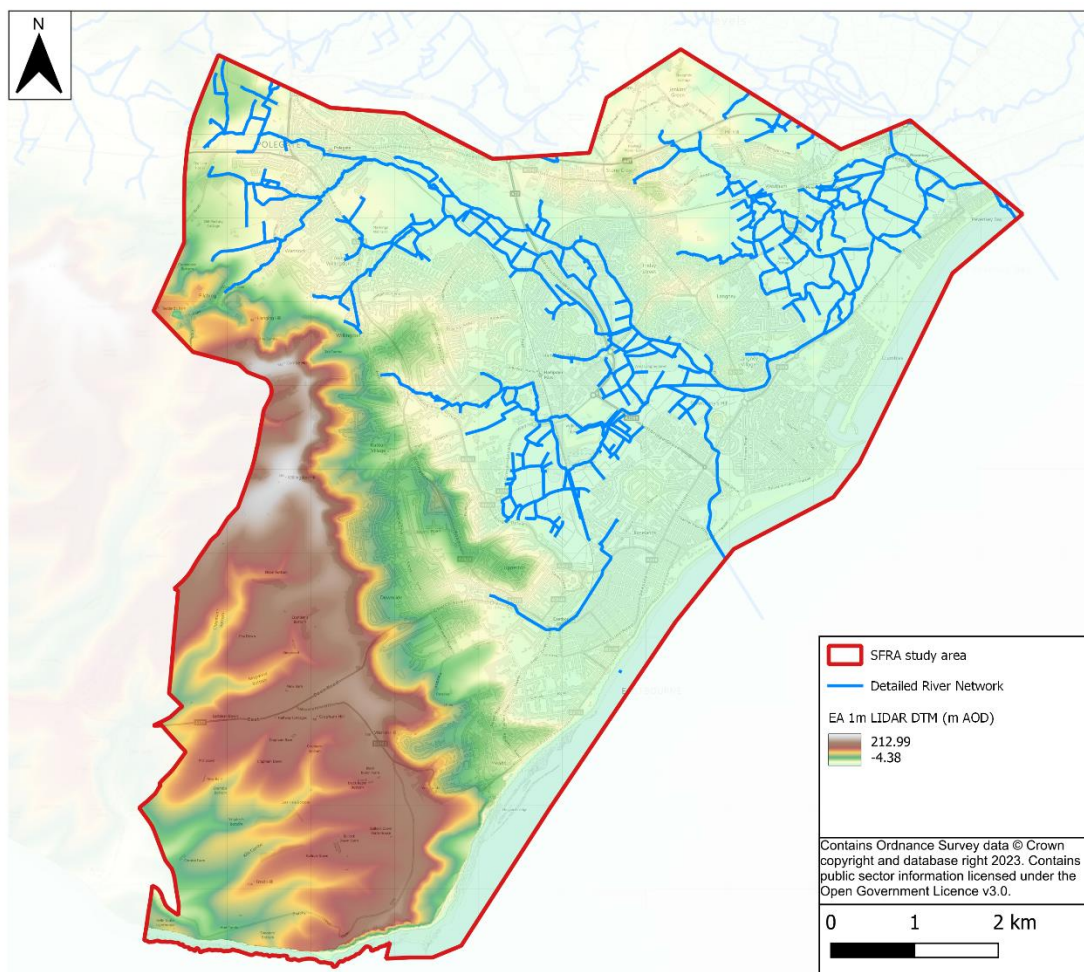
1 Introduction

This note sets out the definition of Coastal Resilience and Adaptation Areas (CRAA) as part of the Eastbourne and Southern Wealden Strategic Flood Risk Assessment (SFRA) and the intended purpose of these areas in the context of climate resilience, placemaking and spatial planning. It also outlines the methodology that has been used to identify these areas.

1.1 Characteristics of Eastbourne

Eastbourne is a highly constrained coastal location that is sensitive to the impacts of climate change and development pressures. The western side is formed by the South Downs National Park. Much of the central and eastern parts of the study area are extremely low lying and include a complex network of watercourses and hydraulic structures, notably the Eastbourne Lakes.

Figure 1-1: Topography and watercourses in Eastbourne



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1.2 Policy context

Eastbourne is identified in the East Sussex Local Flood Risk Management Strategy as one of the areas of East Sussex at highest risk of flooding. This is due to a complex range of issues including urbanisation, tide locking, culverting of watercourses and groundwater flows at the foot of the South Downs. Southern Water's Drainage and Wastewater Management Plan assessed that 9 out of the 14 planning objectives were assessed as Very Significant and Moderately Significant risks. Overall Eastbourne is the only area in the Cuckmere and Pevensey Levels River Basin Catchment with a "High Level of Concern" and where the proposed investment strategy is to "Improve".

Eastbourne is extremely low lying and at high risk of tidal flooding, the Environment Agency has made a commitment to £200m investment in the Pevensey Bay to Eastbourne Coastal Management Scheme which aims to reduce the risk of flooding and coastal erosion to an estimated 10,000 residential properties as well as key infrastructure, local businesses, heritage sites and nature conservation areas.

1.2.1 National Flood and Coastal Erosion Risk Management Strategy

The National Flood and Coastal Erosion Strategy for England was published in July 2020 and provides the overarching framework for future action by all risk management authorities to tackle flooding and coastal erosion in England. The Strategy looks ahead to 2100 and the action needed to address the challenge of climate change.

- **Strategic objective 1.2:** Between now and 2050 risk management authorities will help places plan and adapt to flooding and coastal change for a range of climate scenarios.
- **Strategic objective 1.3:** Between now and 2050 risk management authorities will help coastal communities transition and adapt to a changing climate.
- **Strategic objective 2.1:** Between now and 2030 all new development will contribute to making places resilient to flooding and coastal change.

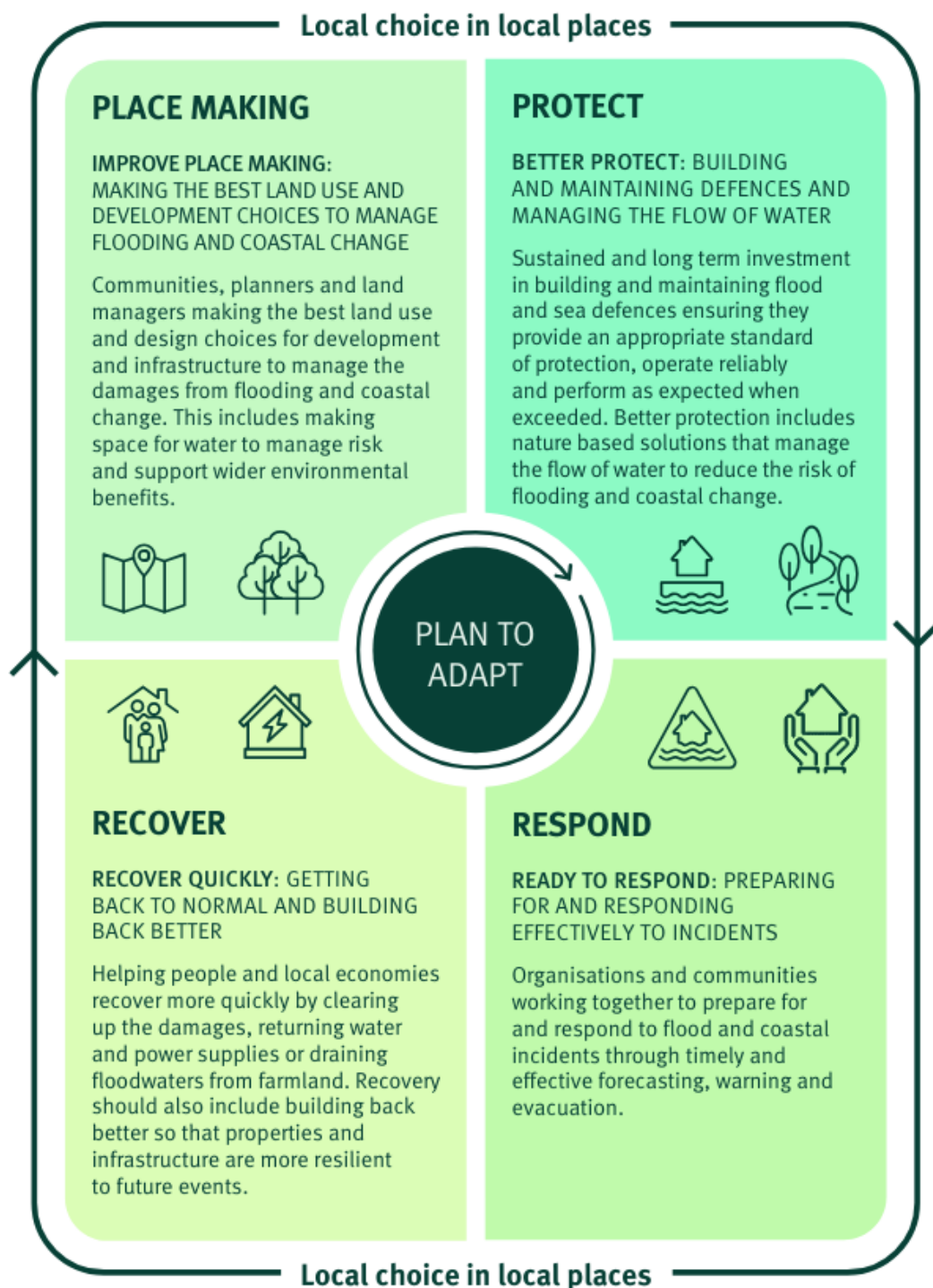
In particular the strategy focuses on the importance of 'resilience' and 'place making' in making the best land use planning decisions and adapting to the challenges posed by climate change. Figure 10 (p47) of the national strategy also states that '*establishing climate resilient local spatial planning policies*' is an example of a resilience action that can be taken to improve place making.

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Figure 1-2: Figure 9 from the National FCERM Strategy 'the different components of resilience'



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2 Coastal Resilience and Adaptation Areas

Prior to the publication of the 2020 National Strategy FCERM in England focused on 'risk management' and a risk based approach. The future challenges facing Eastbourne and addressing the Environment Agency's National FCERM strategy necessitate a change in approach to placemaking in Coastal Areas where the SMP policy is hold the line. The key consideration in such areas is their sensitivity to the impacts of climate change and the necessity for adaptation to feature in a wide range of decision making. It is proposed that establishing a defined Coastal Resilience and Adaptation Area in Eastbourne will allow improved decision making so existing and proposed development is to better adapted to these impacts over time and the resilience of the area generally improved.

2.1 What is a Coastal Resilience and Adaptation Area

This has been defined as an area in the Local Plan where there is a need to increase the resilience capacity of existing and proposed development through adaptation and resilience actions to address the consequences of the increased magnitude and frequency of hazards from tidal, fluvial, surface water, sewer and groundwater flood risks resulting from climate change effects to mean sea level, increased erosion risk and high intensity rainfall.

2.2 What are the considerations in defining Coastal Resilience and Adaptation Areas?

A CRAA will only need to be defined where rates of shoreline change and effects of change in mean sea level are expected to have significant consequences to existing and proposed development over the next 100 years, taking account of climate change. They need to be defined where the accepted shoreline management plan policy is to hold or advance the line (maintain existing, or build new flood and coastal erosion risk management infrastructure) for the whole period covered by the shoreline management plan taking advice from the Environment Agency.

Other sources that may help inform decisions on the appropriate area for the coastal change management area include:

- catchment flood management plans
- shoreline / coastal strategies
- estuary management plans
- harbour management plans
- river basin management plans
- Environment Agency's national coastal erosion risk map

The available climate change mapping from the SFRA for all sources of flood risk should also be used to identify land where resilience and adaptation are considerations with respect to proposed development or redevelopment.

The primary basis for defining a Coastal Resilience and Adaptation Area are the physical processes affecting the coast and the potential accompanying changes to fluvial, pluvial and groundwater flood risk due to predicted changes in mean sea level. The requirement for land use is to establish practice that increases the resilience capacity of existing development and infrastructure and accommodates the

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commitment to take actions that provide for: better protection to people and places; improved response to and recovery from flooding and coastal change; and all the time adapting to climate change.

2.3 What development will be appropriate in a Coastal Resilience and Adaptation Area?

A strategic framework will be established so all key parties in the Coastal Resilience and Adaptation Area share and communicate relevant data, so they are aware of the implications of decisions on planning and resilience actions. It will be a requirement that all proposals in a CRAA will require the preparation of a Flood risk Assessment that includes an Adaptation Assessment.

Development and infrastructure proposed or permitted in a CRAA must be supported by evidence that it will be sustainable, will improve the general level of resilience in the Area, will be able to appropriately accommodate the consequences of shock events (residual risk) and does not include features that adversely affect others or include proposals that constrain the capacity of others to take actions that contribute to adaptation in the Area.

The actual risk of flooding from all sources should be evaluated (sea, river, surface water, sewer and groundwater) within the assessment and consideration shall be given to the consequence of the combined effect of events from different sources. This will be particularly important with respect to the effect of sea levels on the discharge from river, drainage and sewer systems and the implications of this on surface water flood risk.

For all development and infrastructure within a CRAA, the following should be addressed:

- **Within the short-term** (within 20-years), proposed development should be implemented so as to be safe and resilient to future shocks from all sources and combined events. The extent of reliance on proposed schemes to improve protection must be clearly set out and where appropriate provisions made for temporary arrangements to be in place so development is safe prior to implementation of proposed schemes. Safe access and egress will be an influential consideration and proposals that involve evacuation should be avoided.
- **Within the medium (20 to 50-year) and long-term (up to 100-year)**
Development proposals should provide a measurably positive contribution to the wider resilience of the Area. Scheme design should adopt the Sequential Approach described in the planning Practice Guidance so that the vulnerability of development proposals addresses the potential risks. This approach can be through the built form or layout of the development or schemes that reduce the reliance on flood protection and mitigation schemes risk areas and reduces the presence of vulnerable receptors potentially exposed to inappropriate level of hazard. It must be demonstrated that all forms of development proposed will be safe for their intended life and contribute to an increase in the resilience capacity of the Area.
- Development proposals within a CRAA must set out the intended benefit to the wider community and include clear, costed commitments to measures and resilience actions that make development safe for the intended life;

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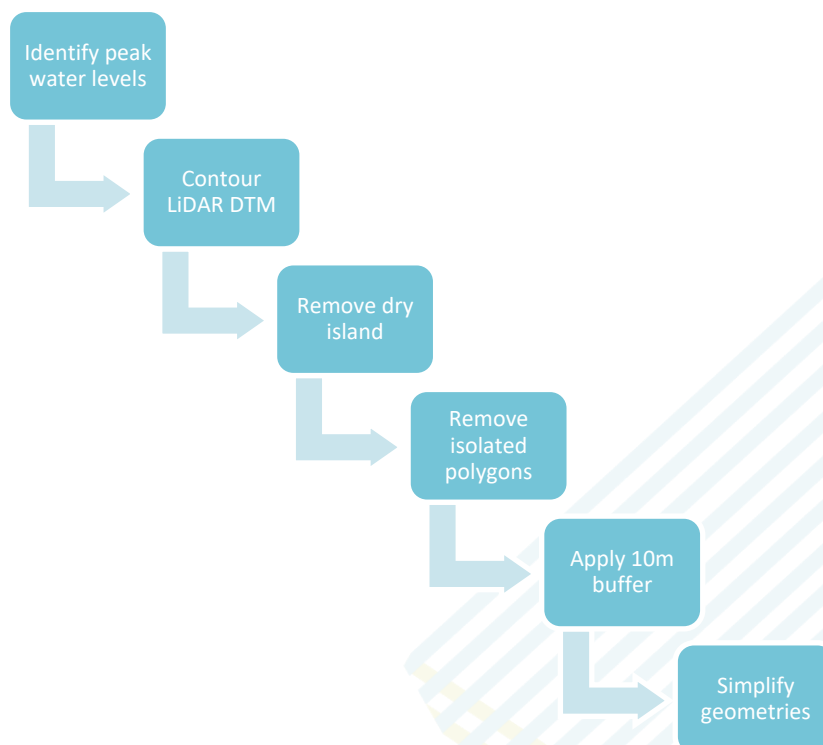
- Existing buildings, infrastructure and land-use subject to the relevant planning permission should adapt and diversify to changing circumstances, where it reduces vulnerability, increases resilience.

3 Methodology

3.1 Approach to defining CRAAs in Eastbourne

Hydraulic modelling undertaken for the Pevensey - Eastbourne scheme has been used as a basis to define the CRAA. **The undefended 1 in 1000 year (0.1% AEP), upper end climate change scenario** has been used as a basis. Peak water levels of 6.56m AOD were prevalent throughout the flood envelope during this event.

In order to provide a suitably robust methodology for the CRAA, this has been rounded up to 7m AOD, and land at or below **7m AOD** has been used to contour the Environment Agency's 1m LiDAR DTM (2022).



The following geoprocessing tools/ steps were applied to the data to generate the CRAA:

- Removal of 'dry islands'** - dry islands which are areas completely surrounded by a CCRA have been removed from the dataset and are considered to form part of the CCRA. Due to their isolation, these areas will still be impacted by climate change and there will be a need to consider adaptation and resilience for development.
- Removal of isolated polygons** - small, isolated polygons have been removed where it is considered that these are artifacts of the geoprocessing techniques

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applied above as opposed to identifying areas likely to be impacted by the impacts of climate change.

- 3 **Application of a 10m buffer** - to provide a conservative justification of the CRAA area, a 10m buffer has been applied to the dataset.
- 4 **Simplification of geometries** - the geometry of the CRAA has been simplified using geoprocessing tools available in QGIS, the application of a buffer prior to this step prevents the data from being clipped in areas where it is appropriate to define a CRAA.

3.2 Eastbourne Coastal Resilience and Adaptation Area

Applying the above methodology has identified a significant area of Eastbourne that falls within a Coastal Resilience and Adaptation Area. This extends as far upstream as Polegate although does not extend beyond the tidal limit. It also encapsulates the Eastbourne Lakes, Langney, Roselands and large parts of the town centre. This is broadly consistent with the existing understanding of flood risk to Eastbourne.

