TIER 1 CLIMATE CHANGE RISK ASSESSMENT

Wexford County Council

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1 EXECUTIVE SUMMARY

On behalf of Wexford County Council (WCC), RPS has prepared a Tier 1 Qualitative Local Authority Climate Change Risk Assessment (CCRA) as part of the Development of the Local Authority Climate Action Plan (LACAP). In accordance with the methodology provided in Annex B of the LACAP, this report provides for an assessment of the current and future climate risks and impacts on the operations and efficient delivery of services by the local authority. The assessment of these risks will raise awareness of the consequences of climate change, identify climate change adaptation intervention, helps to prioritise risks, and helps to monitor and track changes in climate risks.

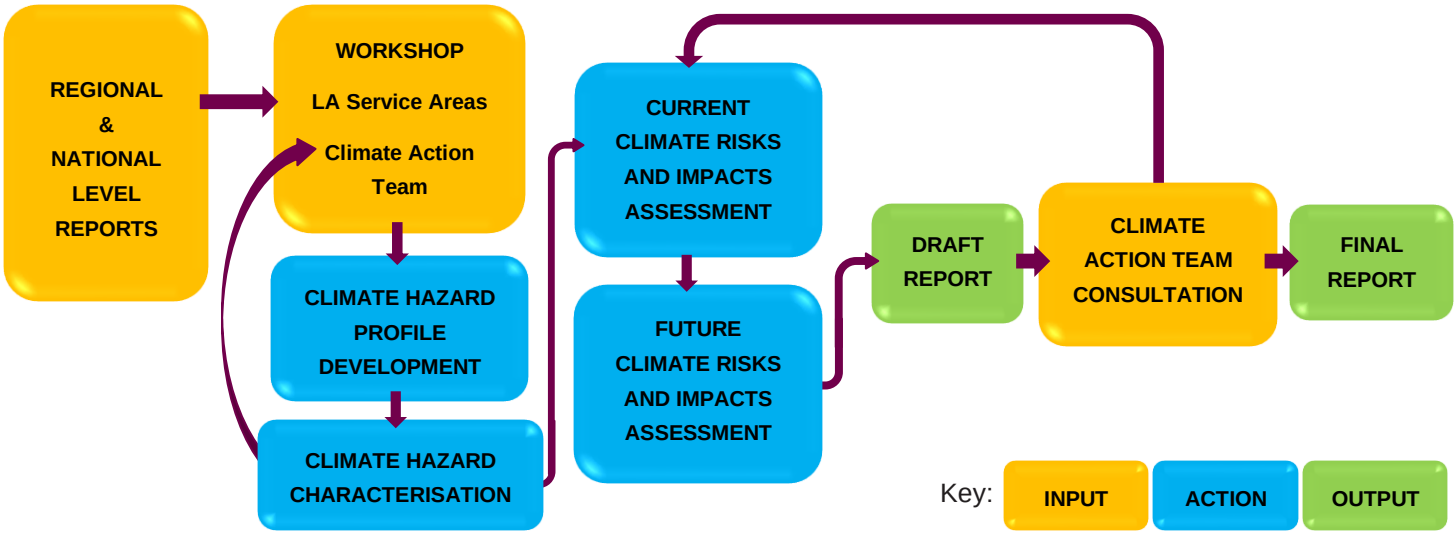
The review undertaken for this CCRA included collating existing regional and national level data relating to climate event followed by a multi-party workshop with key service area stakeholders within Wexford County Council to review of historic climate events, hazards, impacts, exposures and vulnerabilities.

This process resulted in the development of a climate hazard profile for County Wexford. Following an assessment of the nature and frequency of climate hazards a qualitative assessment of the overall impact based on the level of disruption to the delivery of local authority services and functions was assessed for both current and future climate events.

Based on the qualitative risk assessment, as presented in this report, the most significant current climate risks in County Wexford were identified as: River Flooding; Coastal Flooding; and Coastal Erosion.

Increasing impacts are envisaged for future climate events across the majority of climate hazards however future projections indicate that flooding and erosion risk are likely to remain as the most significant.

This CCRA can be used to inform the general strategies to mitigate current and future impacts. Based on these strategies and further quantitative assessment, supported by detailed climate event records as recommended in this report, more detailed mitigation measures can be identified.



2 CONTEXT

The National Climate Change Adaptation Framework (NCCAF) developed in 2012 provided a strategic policy focus to ensure adaptation measures were taken across different sectors and levels of government to reduce Ireland's vulnerability to the negative impacts of climate change. The aim of the NCCAF was to ensure that an effective role was played by all stakeholders in putting in place an active and enduring adaptation policy regime. The governance structure provided for climate change adaptation to be addressed at national and local level, consistent with the approach being taken at EU level in the White Paper on Adaptation

2012 NCCAF

The first phase focused on identifying national vulnerability to climate change, based on potential impacts relative to current adaptive capacity. Reliable information on the range of socio-economic vulnerabilities, the costs and benefits, and the options available and appropriate to Ireland, were key elements to inform effective adaptation planning. A key component was to provide the evidence base necessary to inform development of the national agenda.

2015 CA & LCDA

The second phase involved the development and implementation of sectoral and local adaptation action plans to form part of the comprehensive national response to the impacts of climate change. Sectoral plans are prepared by the relevant Department or Agency and are adopted by the relevant Minister. Draft sectoral plans should be reviewed at least every 5 years.

The Climate Action and Low Carbon Development Act 2015 (CA & LCDA) was a landmark national milestone in the evolution of climate change policy in Ireland. It provides the statutory basis for the national transition objective laid out in the National Policy Position. Further to this, it made provision for, and gave statutory authority to both the National Mitigation Plan (NMP), published in 2017 and the National Adaptation Framework (NAF).

2017 NMP
2018 NAF

Ireland's first statutory National Adaptation Framework (NAF) was published by Minister Denis Naughten TD on 19 January 2018. The NAF sets out the national strategy to reduce the vulnerability of the country to the negative effects of climate change and to avail of positive impacts. The NAF was developed under the Climate Action and Low Carbon Development Act and built upon the work already carried out under the NCCAF.

The annual review of the adaptation progress in Ireland[1] gives a summary of the progress made by various sectors on the adaptive capacity, resource and mainstreaming, and governance of the implementation of climate change adaptations. The Climate Action Regional Offices (CARO) and Local Authorities are listed under the Local Government Sector, which has shown good overall progress in 2022. The key challenge remains the resourcing of dedicated staff to ensure consistency, coordination, and implementation. The realised desire noted for closer working with national agencies on risk assessments, adaptation policies and tools for use by local authorities is essential to enabling progress on adaptation by the local authorities and national agencies. This is highlighted again in the CARO progress report[2] where delays in the delivery of implementation are due to lengthy stakeholder consultation processes; capacity and capability constraints across the public sector; and desires for alignment with other measures to enhance impact.

2019 CCAS

This Climate Change Risk Assessment (CCRA) will inform the adaptation section of the new Wexford County Council Climate Action Plan which will constitute part of the NAF.

CCRAs aim to further our understanding of the risks posed from the changing climate and form an integrated part of any climate change adaptation planning process. CCRAs provide a basis for making decisions on whether risks, and what level of those risks, are acceptable to society or the community by obtaining, collating and analysing information on the projected impacts and consequences of climate change.

2023 CCRA

[1] ECOPRO Project. Climate Change Advisory Council - Annual Review 2022. 2022

[2] CARO. CARO - Progress Report 2022 Implementation of Actions for Climate Change Adaptation Strategy. 2022

3 INTRODUCTION

RPS was contracted in November 2022 to carry out a Tier 1 Qualitative Local Authority Climate Change Risk Assessment (CCRA) for Wexford County Council, as part of the development of their Local Authority Climate Action Plan LACAP, in accordance with the methodology provided in Annex B of the Local Authority Climate Action Plan Guidelines. The CCRA focuses on the delivery of services and functions by the local authority.

In line with the methodology provided within Annex B of the Guidelines, the CCRA provides for:

- Current Climate Risks and Impacts Assessment i.e. An assessment of the current climate hazards, exposure and vulnerabilities of climate change on the operations and efficient delivery of services by the local authority.
- Future Climate Risks and Impacts Assessment i.e. An assessment of future climate risks and impacts on the operations and efficient delivery of services by the local authority.

3.1 Tier 1 Assessment

Climate change risk assessments can be qualitative (Tier-1), semi-quantitative (Tier-2), or fully quantitative (Tier-3), with each tier building on the previous and requiring an increasing level of data, information, and complexity to develop[3]. This climate risk assessment uses a qualitative (Tier-1) approach.

A first-pass assessment (Tier 1) is a rapid qualitative process that can be carried out without detailed local data to develop a preliminary understanding of the climate change risks over a range of scales, from local to regional. This process helps users to screen climate-related hazards and identify specific risks that may arise from these hazards, and which should be investigated further (through second- and third-pass risk assessments). This first-pass screening is ideal when carrying out a CCRA with resource constraints, including limited data and information. It also allows integration of data and information from a variety of (qualitative and quantitative) sources. This is an important early step in climate adaptation planning. Usually, the initial first-pass risk assessment is conducted with limited project-specific data, instead using qualitative information, evidence from published literature and available data such as default national figures.

Appendix A presents the different characteristics and requirements of each of the three risk assessment tiers.

3.2 Approach

Assessment of climate change risk underpins evidence-based adaptation planning and implementation. Climate change risks differ from other risks as it can be difficult or even impossible to quantify short-term or long-term probabilities. As a result, conventional risk assessments that use statistical probabilities can be ineffective.

To assess climate change, risk is composed of three inter-related components[4]:

- **Hazards:** Refers to potential source of harm in terms of damage/loss of property/infrastructure, potential injury, loss of life or other health impacts, livelihoods, service provision, ecosystems, and environmental resources. In this document, this term refers to climate-related physical events or trends or their physical impacts.
- **Exposure:** Refers to the presence of assets, infrastructure, property, people, livelihoods, species or ecosystems, environmental functions, services, resources in places or settings that could be affected. It is important to note that exposure can change over time, e.g., because of land use change.
- **Vulnerability:** Refers to the propensity or predisposition to be adversely affected. This encompasses sensitivity (which refers to the degree to which an exposure will be adversely or beneficially affect by climate hazards) and adaptive capacity which refers to ability of systems, institutions, humans, and

[3] Stephen Flood et al., National Risk Assessment of Impacts of Climate Change: Bridging the Gap to Adaptation Action, Report 346 (EPA Research, 2020).

[4] ISO, “Adaptation to Climate Change – Guidelines on Vulnerability, Impacts and Risk Assessment (14091),” vol. ISO 14091:, 2021.

other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences.

Figure 3-1 shows the direct and indirect interconnections between the three components of climate risk and highlights the need to understand elements of both climate and socioeconomic processes to assess risk. Therefore, to understand the possible impacts of climate change, a climate change risk assessment is required. It has been acknowledged that the Sixth Assessment Report was published on the 20 March 2023, however this report refers to the Fifth IPCC Assessment Report as this was available at the date of completing the CCRA.

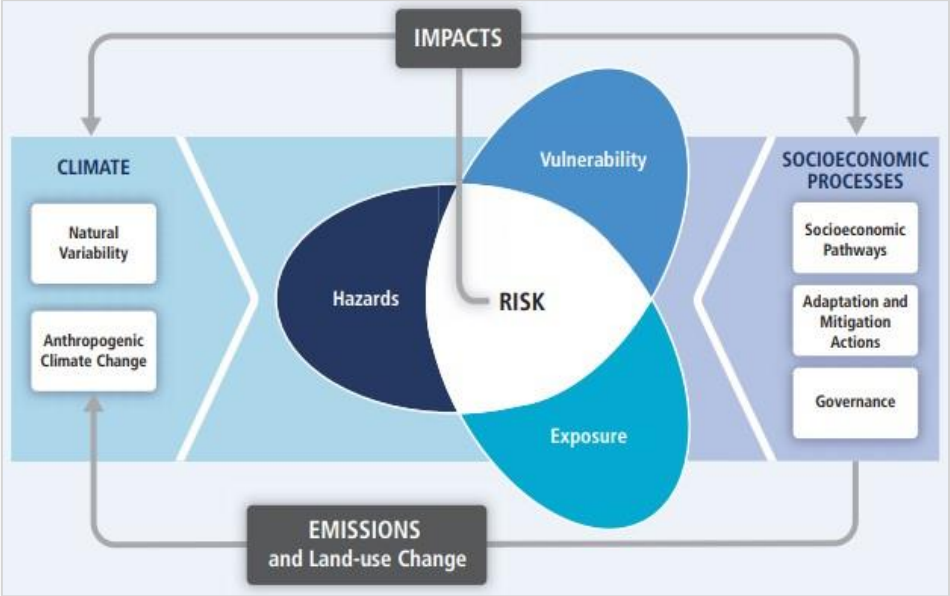


Figure 3-1: The Intergovernmental Panel on Climate Change Assessment Report 5 Framework of Climate Risk which shows how the three components of risk (hazards, exposure, vulnerability) are connected to climate and socioeconomic processes[5]

Climate risk assessments provide several benefits:

- Raising awareness: Risk assessments help increase awareness of the consequences of climate change.
- Identification and prioritisation of risks: Many factors can contribute to a climate risk, and climate change risk assessments provide insight into these factors, and this helps the organisation to prioritise the risks to be addressed.
- Identification of entry points for climate change adaptation intervention: The results and the process of risk assessment can help identify possible adaptation responses. Risk assessments can show where early action is required, e.g., to avoid locking-in future impacts and to highlight the need for development of adaptive capacity.
- Tracking changes in risk, and monitoring and evaluating adaptation: Repeating risk assessments can help to track changes over time and generate knowledge on the effectiveness of adaptation.

[5] IPCC, Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, ed. C.B. Field et al., Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 2014), papers2://publication/uuid/B8BF5043-C873-4AFD-97F9-A630782E590D.

This Report provides a qualitative (Tier-1) climate change risk assessment undertaken for County Wexford and was developed on the basis of the existing local authority adaptation strategy guidelines[6] , along with the *'Adaptation to climate change - Guidelines on vulnerability, impacts and risk assessment'* International Standard[7] , guidance on the climate proofing of infrastructure[8] , the National Risk Assessment of Impacts of Climate Change[9] , and ongoing risk assessment research.

In addition, the approach outlined within this Report builds upon the data and information produced within the previous local adaptation strategy. **Figure 3-2** provides an overview of the key stages of developing the CCRA. An assessment of the current climate hazards, exposure, vulnerabilities, and impacts leads to the 'Current Climate Risks and Impacts'. This is followed by an assessment of future climate risks and impacts, resulting in the 'Future Climate Risks and Impacts'.

A workshop was held with multi-party input across a wide range of services areas within Wexford County Council, where historic climate events, existing hazards, exposures and vulnerabilities were discussed.

Figure 3-2: Overview of the stages of the Climate Change Risk Assessment Spreadsheet

[6] DCCAE, "Local Authority Adaptation Strategy Development Guidelines," 2018.

[7] ISO, "Adaptation to Climate Change - Guidelines on Vulnerability, Impacts and Risk Assessment (14091)."

[8] European Commission, "Technical Guidance on the Climate Proofing of Infrastructure in the Period 2021-2027," 2021.

[9] Flood et al., National Risk Assessment of Impacts of Climate Change: Bridging the Gap to Adaptation Action.

4 COUNTY WEXFORD

County Wexford is in the south-east corner of Ireland. It is a maritime county, bounded by the sea on two sides—on the south by the Atlantic Ocean and on the east by St. George's Channel and the Irish Sea, with a coastline that extends to approximately 260 km. The county has a land area of approximately 236,527 ha, composed of gently rolling countryside from the Hook Peninsula on the south-west coast, the slob lands in the east, the Slaney River valley and Barrow River valleys to the foothills of the Blackstairs Mountains in north-west of the county. It has four main towns. Wexford and New Ross are located in the south and west of the county, while the towns of Enniscorthy and Gorey support the northern part of the county.

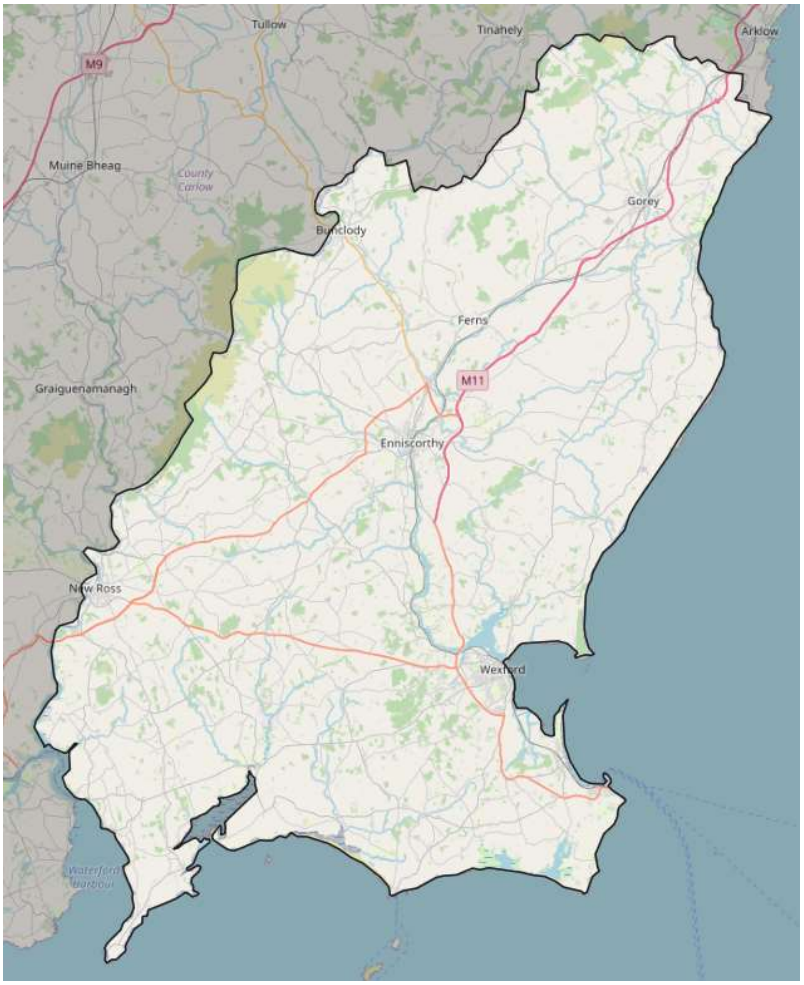


Figure 4-1: Characteristics of Wexford

The road Network in County Wexford consists of over 3400km of road network comprising 25km of Motorway and 171km of national roads[10]. The remaining network consists of both regional and local roads. The Rosslare Harbour Dublin railway line is now the only operating rail service in the county and is designated as a Strategic Radial Corridor in the National Spatial Strategy 2002-2022 (NSS).

Land area of almost **240,000 ha**

Approximately **260km** of coastline

Over **3,400km** of road

[10] WCC Climate Change Adaptation Strategy 2019-2024. 2019

The population of County Wexford stood at 149,722 in 2016, with a preliminary 2022 population of 163,527 resulting in a 9.2% increase on 2016[11]. According to the 2016 Census, the population aged 0 to 24 Years residing in Wexford represents 33.3% of the total population. The '65 and over' age cohort now represents 14.7% of the total population living in the county. In Census 2022, County Wexford's housing stock stood at 72,028[11]. The Social Housing stock in Wexford is currently 4,777 units[12].

Population in 2016: 149,722

0 to 24 Years: 33.3%

65 and over: 14.7%

Social Housing: 4,777 units

Since January 2014, WCC has a Service Level Agreement (SLA) with Irish Water in relation to the provision of water and wastewater services[10]. WCC operates 212 facilities and 2,050 km of public water mains serving approximately 105,000 people on behalf of Irish Water through the SLA[10]. The Council also operates 189 wastewater facilities and 647 km of public sewer throughout the county treating the waste from both domestic and trade/industrial sources on behalf of Irish Water through the SLA[10]. Approximately 55% of the population is serviced by public wastewater facilities with the remainder serviced by privately operated or individual treatment plants[10].

8 out of **9** 'Excellent' bathing waters

Major rivers – River **Barrow** and River **Slaney**

Wexford is located in the Irish River Basin District. The single river Basin District covers an area of 70,273km2 with 46 catchment management units consisting of 583 sub-catchments and 4,829 waterbodies[10]. The two major rivers in Co. Wexford are the Slaney and the Barrow. Other rivers include Owenduff, Pollmounty, Corrock, Urrin, Boro, Sow, Bann, and Owenavorragh.

There are many established uses along the coastline including ports, harbours, fishing, aquaculture, residential, leisure and amenity. There are two principal ports in the county: Rosslare Europort and New Ross Port. 211km of the coast is classified as 'soft' coast with 100km considered at risk[10]. Bathing water quality in Wexford is predominantly "Excellent" with 8 of the 9 designated bathing waters identified as excellent quality[13]. There are 6 blue flag beaches – Ballymoney, Morriscastle, Ballinesker, Curracloe, Rosslare, and Carne (2018) and 2 blue flag marinas located at Kilmore Quay and New Ross. There are also 9 Green coast beaches identified in the county.

Approximately 1,700 Monuments

Over 1400 structures on the RPS

County Wexford has a rich natural and built heritage of landscapes, flora, fauna, habitats, monuments, archaeology and heritage objects. Wexford has a significant number of sites designated for protection under national and European Legislation. These include Special Areas of Conservation (Habitats) Special Protected Areas (Birds) and Natural Heritage Areas. Together, Special Protection Areas (SPAs) and Special Areas of Conservation (SAC's) make up a network of European Sites known as the Natura Network. There is currently one SAC, fifteen candidate SAC's and nine SPAs in County Wexford. There are approximately 1,700 monuments in County Wexford included on the Record of monuments and Places, and in excess of 1,400 structures on the Record of Protected structures according to Volume 13 of the CDP 2022-2028[13].

These characteristics of the County can reduce or exacerbate the impacts of climate hazard types and provides a better understanding as to which hazards are most damaging.

[11] www.cso.ie

[12] WCC Socio- Economic Statement February 2023 Wexford Local Economic and Community Plan

[13] WCC. Wexford County Development Plan 2022-2028. 2022

5 WORKSHOP

RPS facilitated a workshop with Wexford County Council on Monday 21st November 2022.

The workshop was useful for introducing the local authority teams to the CCRA process, in relation to previous risk assessment and adaptation planning, and cementing understanding and support for the CCRA.

Critical to the success of developing a CCRA is ensuring multi-party input to the process to ensure that all relevant triggers, events and receptors are suitably captured and addressed. The workshop served as the key medium to engage with all service departments within WCC and allow for a multi-expert input to the final risk classifications. The collected notes from the workshop are provided in **Appendix B**. As noted by the guidance, the CCRA process focuses on the delivery of services and functions by the local authority.

The following WCC services were represented within the workshop:

- Tourism
- Roads
- Insurance Risk Management
- Environment
- Machinery Yard
- Forward Planning
- Water
- Housing Capital
- Special Projects
- Housing Operations/Maintenance
- Civil Defence
- I.T.
- Coastal/Marine
- Finance
- Library Services
- Fire Service
- Waste Management
- Trails

The risk assessment tables, and output matrices produced within the appendices of this report were guided by national level risk assessment and further developed through both objective and anecdotal evidence brought forward by Wexford County Council, to create a bespoke but consistent CCRA output that meets the needs at a local authority level.

6 ASSESSING CURRENT CLIMATE RISKS AND IMPACTS

Understanding current climate impacts is critical to developing an understanding of future climate risks. Assessment of the current climate impacts involved:

- Identifying the range of climate hazards that have previously affected Wexford and its administrative area, and
- Assessing the exposures and vulnerabilities of the local authority and its administrative area to these hazards.

6.1 Climate Hazards Profile

In collaboration and consultation with WCC, and with the collective input by the Eastern & Midlands CARO County Councils of Waterford, Kilkenny, Tipperary, and Carlow, a timeline of climate hazards historically affecting the local authority area have been identified and developed within this report. Climate hazards include extreme weather events and periods of climate variability, for example:

- Extreme weather events, e.g., extreme rainfall, flooding, storms, extreme heat, or drought.
- Deviations from average climatic conditions over a given period of time, e.g., periods of above or below average conditions in the spatial and/or temporal distribution of precipitation, or changes in average temperature.

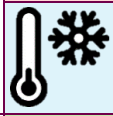
It is important to consider and identify, that many climate hazards are created or exacerbated by a pre-condition, e.g., a heavy rainfall event on saturated soils resulting in flooding. In addition, it is important to consider that the co-occurrence of multiple climate hazards can directly or indirectly exacerbate existing hazards or create new hazards, e.g., a storm causing a coastal storm surge and precipitation resulting in high river and coastal water levels resulting in river and coastal flooding, or a heavy rainfall event after a period of drought creating surface water flooding.

The climate hazards profile is presented in three ten-year periods, as seen in **Figure 6-1**, **Figure 6-2**, and **Figure 6-3**, which provides a review of the extreme weather events in County Wexford over the past 30 years. All climate hazards identified within a single event are noted within the profile. An expanded summary of each event is provided in **Appendix C**.

Table 6-1 lists the climate hazard types identified as providing existing risk to County Wexford. This hazard type classification was adapted from IPCC[14].

[14] "Summary for Policymakers." In Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, edited by V. Masson-Delmotte, P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, et al. Cambridge University Press, Cambridge, 2021. https://www.ipcc.ch/report/ar6/wg1/.

Table 6-1: Climate Hazards Identified for Wexford County

Type		Climate Hazards
Heat and Cold		Above Average Surface Temperature
		Heatwave
		Drought
		Cold Spell
Wet and Dry		Above Average Precipitation
		Extreme Precipitation
		River Flood
		Pluvial Flood
Wind		Severe Windstorms
Snow and Ice		Heavy Snowfall
Coastal		Increase in Relative Sea Level
		Storm Surge
		Coastal Flood
		Coastal Erosion

- River flood
- Pluvial flood
- Extreme Precipitation
- Severe windstorm
- Storm surge
- Coastal erosion
- Coastal flood
- Heavyy snowfall
- Heatwave
- Drought
- Above average surface temperature
- Increase in relative sea level
- Above average precipitation
- Cold spell

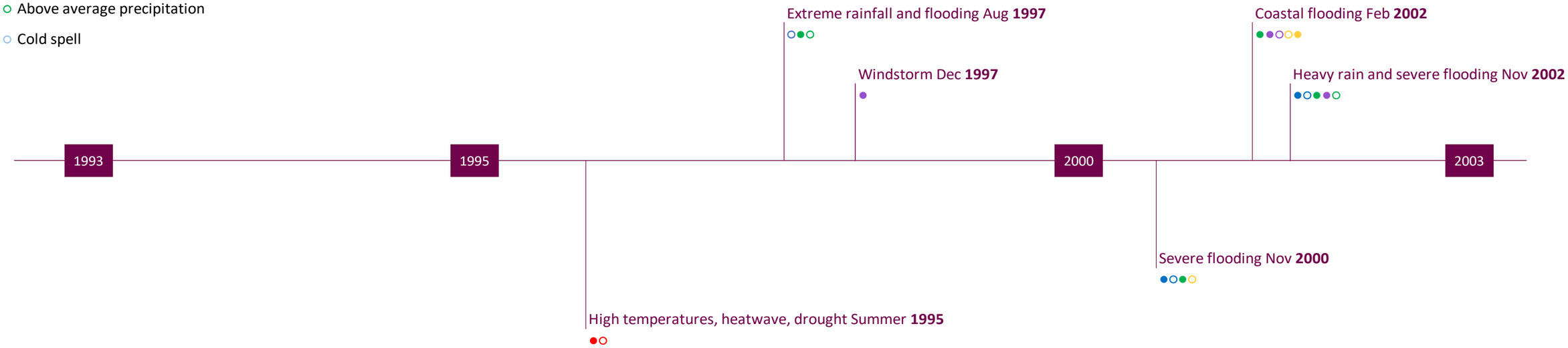


Figure 6-1: Climate Hazard Profile 1993-2003

- River flood
- Pluvial flood
- Extreme Precipitation
- Severe windstorm
- Storm surge
- Coastal erosion
- Coastal flood
- Heavvy snowfall
- Heatwave
- Drought
- Above average surface temperature
- Increase in relative sea level
- Above average precipitation
- Cold spell

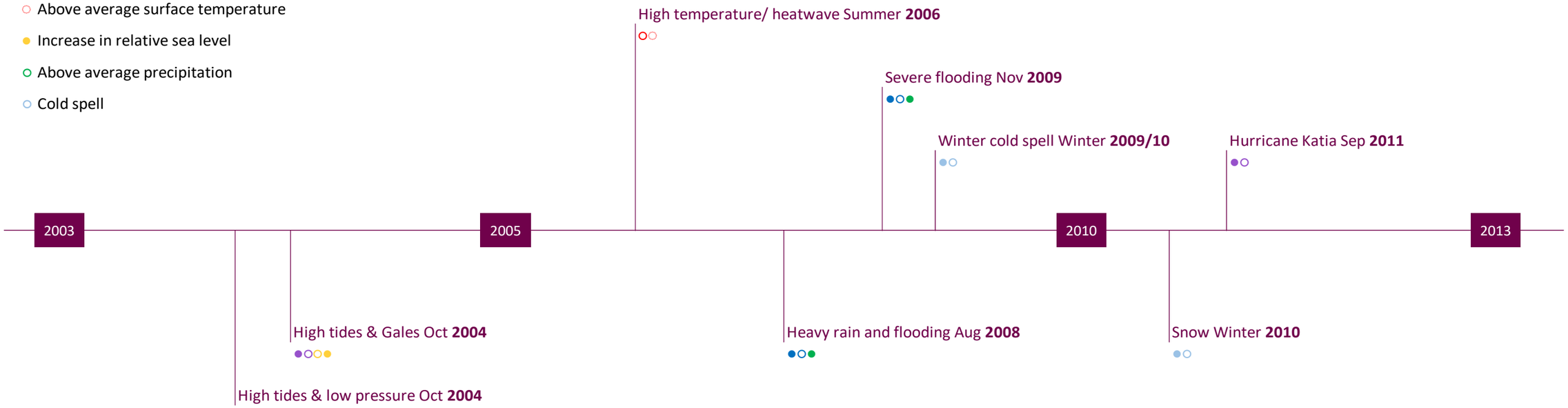


Figure 6-2: Climate Hazard Profile 2003-2013

Figure 6-3: Climate Hazard Profile 2013-2023

6.2 Characterising Climate Hazards

Understanding the nature and frequency of the identified climate hazards helps to produce a deeper appreciation of the scale of risk presented by each hazard type.

6.2.1 Description

A character profile was developed from available information for each of the identified hazard types. Whilst keeping to the scale of a Tier 1 assessment, geographical and spatial characteristics, including relevant specific details associated with past hazards events are included where possible.

6.2.1.1 Flooding

The *National Risk Assessment of Impacts of Climate Change: Bridging the Gap to Adaptation Action*[15] indicates that flooding represents one of the most immediate risks on a national basis, highlighting the significance of this hazard. According to *Climate Change Adaptation: Risks and Opportunities for Irish Businesses*[16], research in 2016 concluded that based on European projections, damage from flooding could amount to €1bn per year in Ireland.

In acknowledgement of the magnitude of risk that flooding presents to the county, WCC developed a Major Emergency Plan which covers advanced preparation, pre-flood actions, and flood awareness, highlighting the presence of flood risk[17].

6.2.1.1.1 River Flooding

River Flooding

River flooding occurs when the capacity of a river channel is exceeded, leading to rivers bursting their banks. This can be exacerbated by high tide levels impeding the flow of the river out into the sea. Factors influencing the severity of the flood include the size and slope of the catchment, the physical qualities of the soil and underlying rock, surface run-off, and drainage network.

Ten occurrences of significant river flooding in County Wexford are noted, with additional localised events, within the 30-year profile of climate hazards. Local impacts of flooding noted within the County include damage to critical infrastructure, reduced function of transport routes, increased maintenance and report works, water quality impacts, environmental contamination, stress on biodiversity and environmentally sensitive areas in additional to ongoing socio-economic implications and pressure on overworked emergency response staff over prolonged periods.

Shannon Quay Flooding

[15] Stephen Flood et al., National Risk Assessment of Impacts of Climate Change: Bridging the Gap to Adaptation Action, Report 346 (EPA Research, 2020).

[16] Karen Deignan et al., Climate Change Adaptation: Risks and Opportunities for Irish Businesses, Report 402 (EPA Research, 2022).

[17] WCC. Wexford County Council Major Emergency Plan. 2016

November 2002

Slaney River in Enniscorthy burst its banks causing extensive damage

In 2011, as a requirement of the EU 'Floods' Directive, the National Preliminary Flood Risk Assessment (PFRA) identified areas where the risks associated with flooding might be significant. Areas for Further Assessment (AFA) were progressed to the Catchment Flood Risk Assessment and Management (CFRAM) Studies in 2016, where more detailed assessment was undertaken to assess the extent and degree of flood risk more accurately. Where the significance of the risk was confirmed, possible measures to manage and reduce the risk were identified. Ten locations in County Wexford were designated AFAs, these were:

Blackwater, Bunclody, Courtown, Enniscorthy, Gorey, Kilmore, New Ross & Environs, North Slobs, South Slobs and Wexford.

A Flood Risk Management Plan (FRMP) for the Slaney & Wexford Harbour River Basin was completed in 2018. The plan set out the strategy, including a set of measures, for the cost effective and sustainable, long-term management of flood risk in the Slaney River Basin, including the areas where the flood risk has been determined as being potentially significant. The Plan includes feasible measures developed through a range of programmes or policy initiatives including: – Non-structural flood risk prevention and preparedness measures, structural flood protection measures for communities at significant flood risk, aimed at reducing the likelihood and/or degree of flooding, as identified through the National Catchment Flood Risk Assessment and Management (CFRAM) Programme.

In addition to the above FRMP, 100 properties in New Ross and Environs were protected by a Flood Relief Scheme (FRS) in 2009 at an estimated cost of €600,000. An additional 505 properties are also due to be protected through the ongoing Enniscorthy FRS and Wexford FRS. Outside of these larger schemes, minor mitigation works undertaken since 2009 include 16 no. projects at a combined cost of €3,157,965 across County Wexford[18].

6.2.1.1.2 Pluvial Flooding

Pluvial Flooding

Pluvial flooding occurs when the amount of rainfall exceeds the capacity of urban storm water drainage systems or the ground to absorb it. As a result, there is overland flow of excess water leading to ponding in depressions in the ground, behind obstructions, or in man-made hollows. This type of flooding typically arises as a rapid response to intense rainfall before the flood waters eventually enter a piped or natural drainage system.

Enniscorthy Flooding

[18] www.floodinfo.ie

December 2021

Flood related calls throughout Christmas day, with further response continuing into St Stephens Day

The collated record of hazard events for Wexford identifies seven instances of pluvial flooding in the past 30 years. Pluvial flooding is typically more localised than river flooding and occurs over a shorter time span. Like river flooding, local impacts of flooding noted within the County include damage to critical infrastructure, reduced function of transport routes, increased maintenance and report works, and water quality impacts. Suspended material is known to block surface drainage systems which could lead to standing bodies of water and prolong the flooding period. Pluvial flooding can be partially due to surface water drainage systems with inadequate capacity. Once these systems reach full capacity, the excess flood water flows overland, causing disruption to services.

6.2.1.1.3 Coastal Flooding

Coastal Flooding

Coastal flooding occurs when sea levels along the coast or in estuaries exceed neighbouring land levels or overcome coastal defences. Extreme wave conditions and surge effects can arise due to wind speed and direction and low-pressure systems which force water into estuaries and harbours. Harbour operations in particular would be affected. This event typically arises in tandem with storm surges and/or high sea levels.

Winter of 2013/14

Combination of strong winds, tidal surges, and low pressure leading to widespread damage and flooding

Eleven events of coastal flooding are noted within the collated 30-year hazard event profile for the county. A number of reports refer to the risks posed to Irish coastlines, such as *South East Irish Coastal Protection Strategy Study*[19], *Local Authority Coastal Erosion Policy and Practice Audit*[20], *Rosslare Coastal Erosion and Flood Risk Management Study*[21], and *Climate Change, Biodiversity & Environment SPC*[22].

The potential coastal flooding risk to Irish coasts, in particular Wexford, is mapped in the South East Coast Protection Strategy Studies[19]. These predictive flood maps show potential flood risk predominantly in or near coastal settlements. Primary areas identified with potential coastal flood risk include Cahore Point to Morriscastle, Wexford to Curracloe, and Rosslare.

[19] OPW. South East Irish Coastal Protection Strategy Study. 2011

[20] MaREI Centre, Environmental Research Institute, UCC. Local Authority Coastal Erosion Policy and Practice Audit. 2017

[21] RPS Consulting Engineers. Rosslare Coastal Erosion and Flood Risk Management Study. 2019

[22] WCC. Climate Change, Biodiversity & Environment SPC – Update on Coastal Matters. 2022

6.2.1.2 Extreme Precipitation

Extreme Precipitation

Extreme precipitation events are periods of rainfall occurring at a higher frequency and intensity than normal, usually leading to flooding. There is a high risk of flooding due to the extreme rainfall. There is also the possibility of water bodies being contaminated and having increased turbidity, reducing the water quality.

The extreme precipitation may also lead to the cancellation of any outdoor events. Ireland has been monitoring rain levels since the late 1700s with two monitoring stations and has reached under 500 rain gauges to this day[23]. There have been 18 instances of extreme precipitation events in the last 30 years based on the hazard events record, highlighting its regular occurrence.

October 2022

Severe rain led to the Wexford Town Water Treatment Plant shutting down due to poor water quality and the inability to treat it. This resulted in low reservoir levels

6.2.1.3 Heavy Snowfall

Heavy Snowfall

Heavy snowfall is the large accumulation of snow usually accompanied with snow drifts. This can lead to precarious footing, potential road or building closure, or damage to infrastructure through excessive roof loading.

Heavy snow during Storm Emma

A major concern from large amounts of snowfall is the serious damage to overhead powerlines and communication lines. This event is becoming less frequent, as the general warming of the atmosphere and oceans is projected to reduce the volume of snow and ice. January and February are the typical months when snow is experienced, but it is not uncommon for snow to be present in the period from November to April[24].

Feb/Mar 2018

Roof collapse occurring in the National Heritage Park due to snow loading and multiple power outages being experienced across the county

There have been only three recorded heavy snowfall events in Wexford in the last 30 years according to the hazard events record. The last time a heavy snowfall event was recorded was in February/March 2018 during Storm Emma and the Beast from the East. Snow drifts led to impassible roads, disruption to services including hospital services, water shortages for a few weeks.

[23] www.met.ie

[24] www.met.ie

6.2.1.4 Severe Windstorm

Severe Windstorm

Severe windstorms are strong wind events which may or may not be accompanied by precipitation. Infrastructure is particularly vulnerable to severe windstorms as strong winds can damage building facades or destroy habitats.

High winds in Storm Ophelia

The fallen debris can then be carried away and act as projectiles leading to further damage or serious injury. In the *National Risk Assessment of Impacts of Climate Change: Bridging the Gap to Adaptation Action*[25], windstorms are listed as one of the priority climate risks in Ireland.

The hazard events record shows a total of 27 severe windstorm events in County Wexford, the most regularly occurring event in the County over the last 30 years. Met Eireann typically send out alerts for high winds, and between September and December 2018, 6 separate alerts were issued.

February 2021

Gusts up to 130km/hr brought about fallen trees and blocked roads county wide, and major power outages

6.2.1.5 Storm Surge

Storm Surge

Storm surges are events where a storm, which is typically brought about by low pressures, produces strong winds that push the seawater onto shore. Infrastructure located in coastal areas are vulnerable to these surges.

November 2004

Computer systems crashed as water levels rose by 5ft more than normal due to a storm surge

Critical infrastructure may be exposed due to the seawater being pushed onto shore, resulting in disrupted transport routes and an increase in clean-up, maintenance, and repair costs. The strong winds which carry the seawater also carries its own risks which are like that of severe windstorm events. The EPA Risk Assessment Report indicates that coastal infrastructure in Ireland is particularly vulnerable to storm surges and changes in storm frequency in many areas in Ireland[26]. Nine storm surge events have been identified that have occurred in Wexford in the past 30 years in the hazard events record. The risk of storm surges is influenced by wind and tide levels, and an increase in relative sea level would increase the baseline risk of the event. The *South East Irish Coastal Protection Strategy Study* indicates the vulnerability of Courtown promenade to wave overtopping during storms[27].

[25] Stephen Flood et al., National Risk Assessment of Impacts of Climate Change: Bridging the Gap to Adaptation Action, Report 346 (EPA Research, 2020).

[26] Stephen Flood et al., National Risk Assessment of Impacts of Climate Change: Bridging the Gap to Adaptation Action, Report 346 (EPA Research, 2020).

[27] OPW. South East Irish Coastal Protection Strategy Study. 2011

6.2.1.6 Coastal Erosion

Coastal Erosion

Coastal erosion is the breaking down and carrying away of materials by the sea. Coastal erosion is often a gradual process where visible signs are not always noticeable but can also lead to vulnerable land to suddenly give way. Soft coasts are susceptible to high erosion rates which can lead to the destruction of infrastructure, such as roads and urban residential areas, and natural heritage that is in contact with the sea.

Erosion in Donaghmore

The Irish Coastal Protection Strategy Study showed that primary areas of potential coastal erosion risk identified are Ardamine, Glascarrig, Killincooly to Blackwater, Blackwater to Ballinesker, Rosslare, Kilpatrick[28]. In 2011, the *County Wexford – Strategic Review of Coastal Erosion*[29] identified Seaview as an additional area of potential coastal erosion risk. The mean annualised erosion rate of all areas along the pilot coastline where an erosion hazard was identified was approximately 0.6 metres[29]. The maximum erosion rate identified occurred at Kilpatrick in County Wexford and equated to an annualised erosion rate of 3.75 metres. There are five records of coastal erosion in the last 30 years based on the hazard events record. In February 2016, the arrival of Storm Imogen brought about localised damage at Donnaghmore, Ballygarrett, where coastal protection works were carried out post event to reduce the impact of coastal erosion. There have been 5 recorded cases in the last 30 years where noticeable changes to the coastline have occurred.

January 2014

Coastal erosion led to the collapse of 30m of wall in Duncannon

Following significant storm damage to parts of the Wexford coastline during the winter of 2006/07, Wexford County Council identified a need to develop an overall view of the risk posed by coastal erosion to assets and infrastructure within County Wexford. The final output of this phase of the study was a series of defined erosion risk zones (21 in total) which were taken forward for subsequent more detailed investigation. As stated previously, this hazard type is a unique case where the hazard is considered as an ongoing process, rather than specific individual events. The *Strategic Review of Coastal Erosion*[Error! Bookmark not defined.] documented 20 coastal sites with identified assets at risk. An extract is provided in **Table 6-2** which also included the estimated damages costs of the assets at risk.

22 sites containing sand dune habitat systems were identified and reviewed along the Wexford Coastline with 6 no. designated pNHA, 8 no. cSAC, 1 no. SAC, 3 no. sites de-designated, and 3 no. sites not designated[30].

Coastal heritage sites are also a significant concern, particularly

- the Ringfort at Killincooley Beg with its eastern banks eroding into the soft sediment sea cliffs.
- Glascarrig motte and bailey site with associated deserted settlement. The site is actively being eroding by the sea.

[28] South East Coast Work Packages 2, 3 and 4A - Technical Report (WEXFORD)

[29] RPS Consulting Engineers. County Wexford - Strategic Review of Coastal Erosion. 2011

[30] National Parks and Wildlife Service. Coastal Monitoring Project. 2009

Table 6-2: Identified Coastal Erosion Assets at Risk[31]

Location	Identified Assets at Risk	Estimate Damages (2011 Cost)
Kilpatrick	Designated Habitat 2 houses 1 caravan 250m of access road	€834,000
Clones Upper	4 Houses	€1,480,000
Duffcarrick -Courtown	Designated Habitat Tourist Amenity Area 650m of road	€650,000
Ardamine	27 cottages 400mof access road	€8,500,000
Pollshone	16 houses	€4,800,000
Rooney Pt –Glascarrig Pt	13 houses 1Ha of land	€3,920,000
Glascarrig Pt –Cahore Pier	10 houses 4 caravans 2 Ha of land	€4,019,000
Cahore – OldBawn	1 House 5Ha of land	€612,000
Kilmuckridge –Blackwaterhead	12 houses 6 caravans 72Ha of land	€6,660,000
Blackwaterhead- Ballinesker	7 houses 9 caravans 1km of road 26Ha of land	€3,948,000
The Raven	14Ha of designated habitat	€280,000
Ardcavan	1 House	
Rosslare	14 Houses 300m of road 1400m of rail track 4.5Ha of land	€8,440,000
Greenore Pt –St Helens	7 houses Clubhouse 10Ha of land	€5,681,000
Ballytrent -Carna	3 houses 6 caravans 11Ha of land	€1,988,000
Carnsore	120m of road	€120,000
Kilmore Quay	9 houses 7Ha of land	€2,258,000
Cullenstown	4 houses 500m of road 5Ha of land	€2,656,000
Fethard	1 house 350m of road 3 Ha of land	€924,000
Duncannon	14 houses	€2,800,000

Note that Estimated Damages are as presented in the County Wexford - Strategic Review of Coastal Erosion (2011).

[31] RPS Consulting Engineers. County Wexford - Strategic Review of Coastal Erosion (2011).

6.2.1.7 Heatwave

Heatwave

The working national definition of a heatwave is five consecutive of days or more with maximum temperature over 25 degrees Celsius[24]. Heatwaves can lead to a few issues, such as uncomfortable working conditions and the potential for heat stroke if there are inadequate measures in place to counteract the heat.

There is a chance of a reduction in water quality as waterbodies may have a high concentration of dissolved material due to evaporation, and an increase in the risk of fires. Fires can occur in both the natural environment and urban environments. Wildfires such as gorse fires and fires in forestry are a high-risk during heatwaves, while BBQs and out of control campfires are likely in urban and recreational areas, e.g. beaches and parks.

In addition, heatwaves usually place recreational areas under stress, putting pressure on existing infrastructure. Another impact due to heatwaves is the altering of the road constitution, where the bitumen in the roads melt. A major concern with predicted changes in heatwaves is the cascading biophysical consequences they may have nationally and locally, e.g., a change in the growing season and changing the habitats that species depend on[24].

Summer 2021

Heatwave led to a loss of water supplies in private wells and some supply interruptions due to high demand

In the last 30 years, there has been evidence of five heatwave events experienced in Wexford based on the hazard events record. There is also the potential for increased pressure on services and infrastructure in parts of County Wexford as people from inland counties migrate to coastal villages and agglomerations. Water services will be impacted greatly as an influx of visitors or migrators will put extreme pressure on water supplies. Treatment plant upgrades for 2023 include Wexford Town, Enniscorthy Town, and Gorey Town, which will help to ensure there is adequate supply in such events.

6.2.1.8 Drought

Drought

Drought refers to the lack of access to water due to reduced water levels from high temperatures because of evaporation. This lack of water can prove to be detrimental to the county as drought is usually accompanied by high temperatures, and with it, high demand for water.

If there is an inadequate supply of water, it will have to be imported by water tankers, which is a high-cost affair. With drought, there is also an increased risk in the transmission of diseases and a risk of treating water with too high a concentration of organic material. Additional emergency response callouts may also be experienced, leading to overworked employees, who are also being exposed to the impacts of drought.

August 2022

Water shortage/ conservation notices were issued to several water supplies in Wexford

There are five records of droughts being experienced in Wexford in the last 30 years according to the hazard events record. In the Summer of 2020, a hosepipe ban was introduced to reduce the use of water. There is also the potential for increased pressure on services and infrastructure in parts of County Wexford as people from inland counties migrate to coastal villages and agglomerations. Water services will be impacted greatly as an influx of visitors or migrators will put extreme pressure on water supplies. Treatment plant upgrades for 2023 include Wexford Town, Enniscorthy Town, and Gorey Town, which will help to ensure there is adequate supply in such events.

6.2.1.9 Above Average Surface Temperature

Above Average Surface Temperature

Above average surface temperatures are periods of heat exceeding the average temperatures of the given period over an extended span of time.

Risks related to this event include the same risks found in both drought and heatwave events, but with more emphasis on increased stress on recreational areas, and less so on reduced water quality and supply. There is the same concern for the ecological structure of the county, as growing seasons will change, causing a shift from normal seasonal activities seen in nature, such as pollination and/or hibernation.

In the last 30 years, there were four events in the hazard events record where above average surface temperatures were noticed. There is also the potential for increased pressure on services and infrastructure in parts of County Wexford as people from inland counties migrate to coastal villages and agglomerations. It is important to note that above average temperatures are not limited to summer. Drops in the frequency and/or intensity of snowfall events and the presence of warmer winters are linked to the increase in average surface temperatures[32].

July 2022

Prolonged extreme temperatures resulted in fire safety warnings being issued

6.2.1.10 Increase in Relative Sea Level

Increase in Relative Sea Level

An increase in relative sea level refers to the gradual increase in baseline conditions of sea levels. Low lying regions along the coast are at risk of an increase in frequency of hazards such as storm surges and coastal flooding as higher sea levels reduce the height needed to cause these hazards. Critical infrastructure located in these low-lying regions will be subject to increased risk to coastal flooding, coastal erosion, and storm surges.

February 2002

Highest tide levels in 80 years. Extreme high tide sent up to two feet of water on to the north and south quays of New Ross town

Studies from the *National Risk Assessment of Impacts of Climate Change: Bridging the Gap to Adaptation Action*[32] also indicate that sea level rise is amongst the highest priority climate risks on a national basis. There have been two occasions where there has been a noticeable impact on infrastructure due to the increase in sea levels in the past 30 years based on the hazard events record. This climate hazard is considered as an ongoing hazard which is difficult to identify as a single event. The main issue with this hazard is how it exacerbates the impacts and potential frequency of other coastal hazards such as storm surges and coastal flooding. A long sandspit stretching north from Rosslare separates Wexford Harbour from the Irish Sea. Until the early 1920s, this spit stretched for many miles north, almost touching the Raven Point and giving a very narrow mouth to Wexford Harbour. At the end of the spit was a small fort called Rosslare Fort. Once Rosslare Fort stood as a sentinel, its guns defending the narrow approaches to Wexford Harbour. In the winter of 1924-25 a storm breached the spit and it was gradually washed away. The fort was abandoned and now all that is left is an island at low tide. Most maps of Ireland, however, still show the long spit of sand.

[32] Stephen Flood et al., National Risk Assessment of Impacts of Climate Change: Bridging the Gap to Adaptation Action, Report 346 (EPA Research, 2020).

6.2.1.11 Above Average Precipitation

Above Average Precipitation

Above average precipitation events are periods of rainfall exceeding the average rainfall of the given period over an extended span of time.

Above average precipitation can lead to more time spent indoors which can affect mental health. A decrease in active travel may also be present which leads to increased use of vehicles running on fossil fuels. Drainage systems may be at risk of reaching capacity as they would be designed for a lower level of precipitation. Observations from the *National Risk Assessment of Impacts of Climate Change: Bridging the Gap to Adaptation Action*[33][32] indicate that average levels of national rainfall have increased by approximately 60mm (5%) for the period from 1981 to 2010 compared with the period from 1961 to 1990.

Three events in the hazard events record indicate above average precipitation levels in Wexford in the past 30 years. The main issue in the increase in average precipitation levels is the increase in the risk of both pluvial and river flooding. Urban areas may not be designed to contain increased levels of rain and result in an increase in flood frequency.

January 2016

Wettest January on record, with 126% of monthly long term average rainfall

6.2.1.12 Cold Spell

Cold Spell

Winter 2009/2010

Coldest winter in almost 50 years based on data from Met Eireann, with temperatures as low as -3.7 degrees Celsius at Johnstown Castle

Cold spells are events where temperatures reach record low temperatures over a short period of time. Cold spells can lead to uncomfortable working conditions if there is a lack of heat sources. Mental health is again a possible issue as less time would be spent outdoors. Water supply may be affected due to frozen water bodies or distribution lines. Cold stress on buildings is another possible risk of cold spells, causing infrastructure to crack. Based on Climate Indices from Met Eireann, cold extremes are becoming both less severe and less frequent[34]. Cold spells, based on the hazard events record, have been experienced with the presence of heavy snowfall three times in the last 30 years.

[33] Stephen Flood et al., National Risk Assessment of Impacts of Climate Change: Bridging the Gap to Adaptation Action, Report 346 (EPA Research, 2020).

[34] www.met.ie

6.2.2 Frequency

Through development of the Climate Hazards Profile, the frequency of climate hazard types affecting County Wexford becomes more apparent. Using the classification categories adopted from Annex B shown in **Table 6-3**, the frequency of existing climate hazard types can be grouped into 5 broad categories. These have then been applied to the hazard types historically affecting County Wexford. The recorded information indicated that Severe Windstorms often combined with Extreme precipitation, are the most frequently occurring climate hazards for County Wexford.

Table 6-3: Classifying the frequency of occurrence of climate hazards

Frequency	Frequency Occurrence in a Year	Description
Very Frequent	> 100%	Occurs several times in a single year
Frequent	50 to 100%	Occurs once in a 1-to-2-year period
Common	10 to 50%	Occurs once in a 2-to-10 years period
Occasional	1 to 10%	Occurs once in a 10-to-100-year period
Rare	< 1%	Occurs once in over 100 years

In classifying the frequency of each hazard type and upon discussion with the representative climate action officer, coastal erosion has been identified as a unique hazard type due to the ongoing nature of this hazard. It was noted that erosion rates have accelerated in Wexford in recent years, as a number of high wind events, storm surge occurrences, and coastal flooding events particularly over the last 5 years have exacerbated the coastal erosion rate at identified erosion risk zones in Wexford as seen in **Figure 6-4**. This is known through ongoing monitoring of the coastline using aerial mapping records, GPS surveys, and drone footage. In addition, monitoring is carried out following extreme weather events. Key historic events providing evidence of significant impacts have been identified in the climate hazard record and profile, but due to the above-mentioned information on the rate of erosion, it is ranked as a very frequent event.

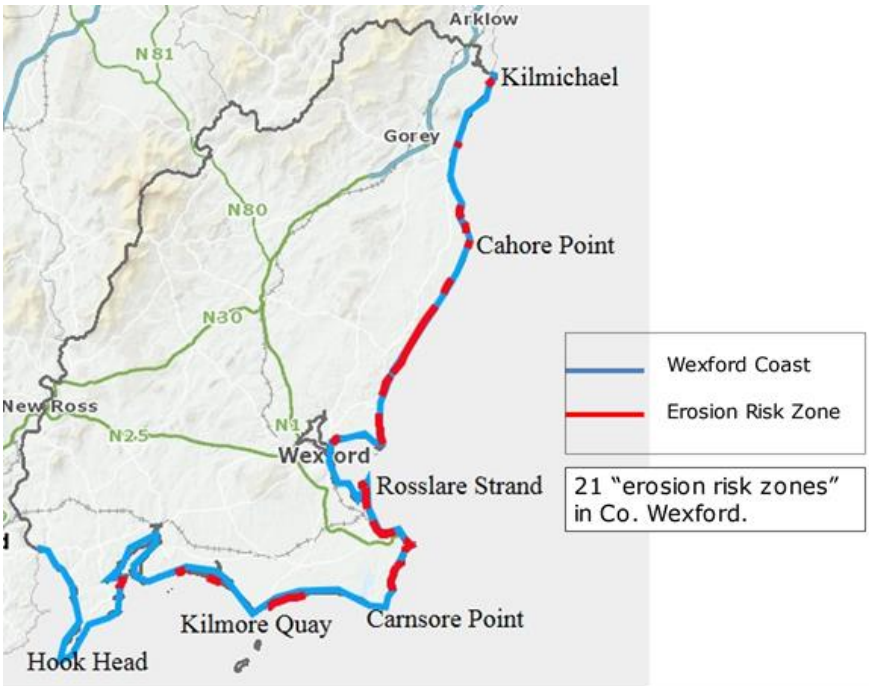


Figure 6-4: Identified 'erosion risk zones' in County Wexford

Table 6-4: Frequency of Current Hazard Types in County Wexford

	Hazard Type	Occurrences	Frequency
	Severe Windstorm	27	Very Frequent
	Coastal Erosion	5*	Very Frequent
	Extreme Precipitation	18	Frequent
	Coastal Flooding	11	Common
	River Flooding	10	Common
	Storm Surge	9	Common
	Pluvial Flooding	7	Common
	Heatwave	5	Common
	Drought	5	Common
	Above Average Surface Temperature	4	Common
	Above Average Precipitation	3	Common
	Cold Spell	3	Common
	Heavy Snowfall	3	Common
	Increase in Relative Sea Level	2	Occasional

* Coastal erosion has been identified as a unique hazard type due to the ongoing nature of this hazard and hence classified as 'Very Frequent'

6.3 Overall Impact to the Local Authority

For each of the climate hazards identified, the overall severity of impact for the following risk areas were estimated:

- Asset Damage,
- Health and Wellbeing,
- Environment (including biodiversity),
- Social,
- Financial,
- Reputation, and
- Cultural Heritage.

The criteria for assessment, as taken from Annex B, is provided in **Table 6-5**. The resultant current impact summary matrix showing the impact versus the frequency for the current climate risks is included in **Appendix E.** The overall level of impact is calculated as the average of impacts across the risk areas. River flooding is concluded to have the highest impact and is therefore the climate hazard type that presents the most risk to County Wexford.

After producing the current impact summary matrix, the current climate impacts of hazards identified can be illustrated according to the current frequency of the hazard, as illustrated in **Figure 6-5**. This allows a simple visual communication of the key risks for the County and a starting point of which events to prioritise.

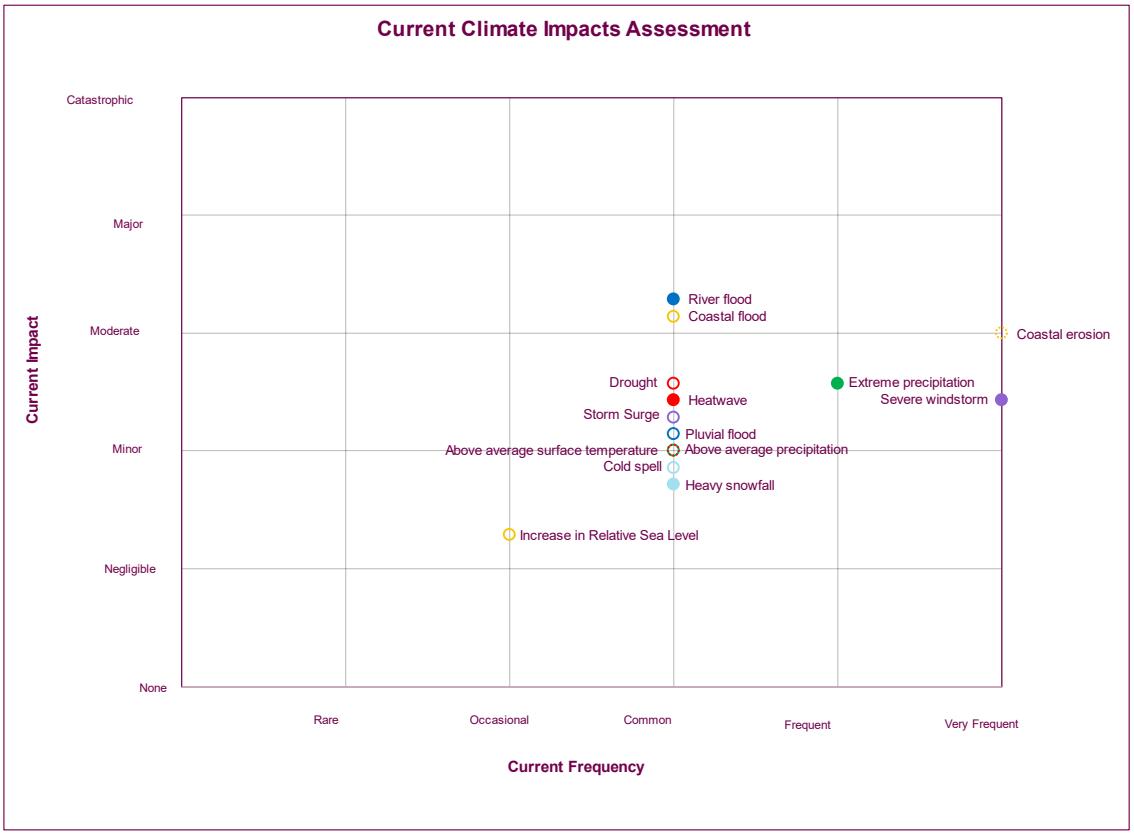


Figure 6-5: Current Climate Impacts Assessment Chart

Table 6-5: Magnitude of impact across various risk areas. Adapted from European Commission (2021)

Risk Area	Impact Level				
	Negligible (Score: 1)	Minor (Score: 2)	Moderate (Score: 3)	Major (Score: 4)	Catastrophic (Score: 5)
Asset Damage	Impact can be absorbed through normal activity	An adverse event that can be absorbed by taking business continuity action	A serious event that requires additional emergency business continuity actions	A critical event that requires extraordinary/emergency business continuity actions	Disaster with the potential to lead to shut down or collapse or loss of assets/network
Health and Wellbeing	First aid case	Minor physical injury or mental health impact, medical treatment required	Serious physical or mental health impact, or lost work	Major or multiple injuries or mental health impact, permanent physical or disability	Single or multiple fatalities
Environment	No impact on baseline environment. Localised in the source area. No recovery required	Localised within site boundaries. Recovery measurable within one month of impact	Moderate harm with possible wider effect. Recovery in one year	Significant harm with local effect. Recovery longer than one year. Failure to comply with environmental regulations / consent	Significant harm with widespread effect. Recovery longer than one year. Limited prospect of full recovery
Social	No negative social impact	Localised, temporary social impacts	Localised, long- term social impacts	Failure to protect poor or vulnerable groups. National, long- term social impacts	Loss of social licence to operate. Community protests
Financial (for single extreme event or annual average impact)	< 2% of turnover	2-10% of turnover	10-25% of turnover	25-50% of turnover	> 50% of turnover
Reputation	Localised, temporary impact on public opinion	Localised, short-term impact on public opinion	Local, long-term impact on public opinion with adverse local media coverage	National, short- term impact on public opinion; negative national media coverage	National, long- term impact with potential to affect the stability of the government
Cultural Heritage	Insignificant impact	Short term impact. Possible recovery or repair.	Serious damage with wider impact to tourism industry	Significant damage with national and international impact	Permanent loss with resulting impact on society

6.4 Characterising Impacts, Exposures, and Vulnerabilities

Throughout Section 6.2 each of the identified climate hazards were characterised to provide on overall appreciation for the nature and scale of each hazard type. Through this characterisation, the national level research, local level environmental and engineering research and reports, the workshop held with the input from WCC Service Areas, and the developed climate history were all used to inform the Impacts, Exposures and Vulnerabilities at the local scale. **Appendix D** presents this collation of information into a tabular output.

For each of the extreme weather events and periods of climate variability identified through the climate hazards characterisation:

1. The impacts of the hazard are identified and described.
2. Specific exposures within each identified climate impact are detailed.
3. For each of the exposures, the associated physical, environmental, and socioeconomic vulnerabilities to the impact were assessed.

Table 6-6 describes each of the three vulnerabilities in more detail. It is important to note that vulnerability can increase or decrease the risk associated with a specific exposure.

Table 6-6: Vulnerability Types

Vulnerability Type	Description
Physical vulnerability	Properties of an asset related to the structure or facilities can exacerbate/reduce the impacts before, during, or after a hazard event, e.g., poor design and construction of building, provision of active cooling. **OR** Ability of a population/persons to access equipment or resources that can exacerbate/reduce the impacts before, during, or after a hazard event.
Environmental Vulnerability	Properties of the environment surrounding the asset/persons that exacerbate/reduce the impacts before, during, or after a hazard event, e.g., limited access to green space that provides respite during heatwave events.
Socioeconomic vulnerability	Properties of a population/persons related to the society, demographics, and economy that can exacerbate/reduce the impacts before, during, or after a hazard event e.g., low income, age, health, English language ability.

6.5 Impact Assessment

This CCRA is focused on the delivery of services and functions of Wexford County Council. For each of the identified climate hazard exposures, the level of disruption to the delivery of services and functions are identified and assessed. The impact assessment is provided within **Appendix D** and includes the perceived degree of impact on the delivery of services by WCC for each exposure in accordance with the high-level criteria for assessment shown in **Table 6-7**[35]. An overall impact score is calculated for each exposure based on a weighted average across each of the Service Areas. The higher the impact score, the greater the overall impact on service delivery and functions of WCC. This can be used to inform priority actions to address exposures which provide the greatest impact. The key to which, can be to increase resilience through mitigation of the vulnerabilities which increase the severity of risks associated with a particular exposure.

As a Tier 1 qualitative study, this is a first-pass risk assessment to develop a quick and broad understanding of climate change risk. It is intended to provide the means to identify a need for strategic and ongoing responses/ commitments, to identify key localities for attention and to build awareness of risk among community and senior management. As it is a high-level screening, it is therefore not suitable for making any final decisions on adaptation actions but should be used to inform the general actions required.

Table 6-7: Description of the levels of impact due to the disruption of Local Authority Services

Impact	Description	Level of Impact
Catastrophic	Widespread service failure with services unable to cope with wide-scale impacts.	5
Major	Services seen to be in danger of failing completely with severe/widespread decline in service provision.	4
Moderate	Service provision under severe pressure. Appreciable decline in service provision at community level.	3
Minor	Isolated but noticeable examples of service decline.	2
Negligible	Appearance of threat but no actual impact on service provision	1

[35] Edinburgh Adapts Steering Group, “Edinburgh Adapts: Climate Change Adaptation Action Plan 2016-2020,” 2016.

7 ASSESSING FUTURE CLIMATE RISKS AND IMPACTS

Understanding how climate change risks are likely to evolve in the future is crucial to identify how existing risks may be exacerbated by climate change or give rise to the emergence of new risks. To understand how climate change risks, and the subsequent impacts, might change into the future, it is useful to first consider how the frequency of climate hazards might change and how levels of impact may also change as a result of changes in the hazard, exposure, and vulnerability components of risk.

7.1 Future Changes in Climate Hazards

Any identification of climate hazards that are likely to be of significance in the future should begin with those that are significant in the present. To understand how levels of climate hazards might change in the future, available climate projection information needs to be examined to understand how the frequency and intensity of extreme weather events and periods of climate variability might change in the future.

For the purposes of adaptation strategy development, fine scale climate information and data is not required. National statements of projected climate changes and impacts are considered appropriate. More detailed assessment and appraisal should be employed when specific plans or measures are to be implemented and more detailed information is necessary.

The information required has been produced through nationally funded research projects, e.g., Nolan and Flanagan[36] and Desmond[37], and is summarised and available online through Climate Ireland.

National level information on projected changes in Ireland's Climate can be accessed through Climate Ireland's Essential Climate Information Tool.

National level information on projected changes in the biophysical impacts of climate change can be accessed through Climate Ireland's Climate Hazard Scoping Tool.

For each of the climate hazards identified through the assessment of current climate hazards and impacts, and on the basis of available projection data, the projected frequency of each of the identified climate hazards was estimated. See **Appendix F** for projected frequencies of climate hazards.

[36] Nolan and Flanagan (2020) Research 339: High-resolution Climate Projections for Ireland – A Multimodel Ensemble Approach

[37] "National Preparedness to Adapt to Climate Change: Analysis of State of Play," 2018, https://www.epa.ie/pubs/reports/research/climate/Research_Report_256.

7.2 Future Changes in Exposure and Vulnerability

Climate risks may develop or increase in the future because of the change in frequency and intensity of climate hazards. However, changes in exposure and vulnerability also affect future climate risks.

In order to establish future levels of impacts, available projections of non-climatic factors on a local level (e.g., County Development Plan, Local Area Plans, Local Economic and Community Plan etc.) were examined to assess potential changes in levels of exposure and vulnerability. Sources include the Wexford County Development Plan 2022-2028[38] and the Wexford Local Economic and Community Plan 2016-2022[39]. For some impacts, there was little existing information to support future impact and vulnerability assessment, resulting in estimates based on available information. There is evidence of protocols and policies in place which reduce targeted vulnerabilities, e.g., the Emergency Homeless Protocol[40] provides guidelines for providing shelters for homeless when weather warnings have been issued or temperatures reach 0 degrees Celsius or lower. Similarly, the Extreme Weather Policies[41] and Housing Adverse Weather Policy[42] outline strategies to reduce the risks involved with extreme weather events for general health and safety and for the protection of homes. The climate adaptation procedures for ports, piers and harbours outlines how to reduce the impact of extreme weather events for the normal functioning of the ports, piers and harbours for the local and wider economy[43]. See **Appendix F** for the assessment of projected changes in exposure and vulnerability.

7.3 Uncertainty

In assessing the future climate risks, there was a degree of uncertainty in how hazards, exposure, and vulnerability will change. Uncertainty is the state, even partial, of deficiency of information related to, understanding or knowledge of an event, its consequence, or likelihood. A range of data and information sources were used in order to mitigate uncertainty in the future risk assessment, but there is still a varying degree of uncertainty present. Therefore, when selecting evidence to inform the climate risk assessment, information related to the uncertainty of projected changes in climate hazards, exposure, and vulnerability are noted within the Rationale column of **Appendix F**.

[38] WCC. Wexford County Development Plan 2022-2028. 2022

[39] WCC. Wexford Local Economic and Community Plan 2016-2022. 2016

[40] WCC. Adverse Weather – Emergency Homeless Protocol. 2022

[41] WCC. Extreme Weather Event Policies/Flood Policy. 2022

[42] WCC. Housing Adverse Weather Policy. 2022

[43] WCC. Climate Adaptation Procedure for Ports, Piers and Harbours.

7.4 Emerging Hazards and Climate Change Risks

Although some activities and services may not currently be affected by climate hazards, it is important to consider the full range of projected changes to hazard, exposure, and vulnerability as these changes may result in increased risk, leading to an exacerbation of impacts to the Local Authority. Following discussion with WCC and taking into account the character of Wexford and its assets, wildfires, phenology degradation, and sea level rise are the main emerging hazards and climate change risks identified.

The increasing risk of prolonged dry periods, above average temperatures and heatwaves is projected to lead to a continued reduction is soil moisture content leading to drier conditions and higher fuel loads. UCC have established a monitoring a recording programme[44] to collate information about wildfires in Ireland and should support the collation of data and impacts as this risk is projected to emerge.

- Fires, Land and Atmospheric Remote Sensing of Emissions (FLARES) undertaken by UCC aims to develop systematic approaches to the acquisition and collation of a range of data on agricultural and uncontrolled wildland burning burn events from satellite datasets.
- In addition to more wildfires there is also a higher risk from fires in urban areas that can quickly become out of control due to dry conditions in green areas.

These increased temperatures may also lead to increased problems with invasive species as the changing environment promotes their growth. Seasonal changes are a significant emerging risk to pollination, as pollinators are showing signs of becoming offset from the time for pollination.

Sea level rise is an ongoing hazard which is projected to rise in the coming years. As mentioned previously, it is a climate hazard which is considered as an ongoing hazard which is difficult to identify as a single event. The main issue with this hazard is how it exacerbates the impacts and potential frequency of other coastal hazards such as storm surges and coastal flooding. These effects will potentially worsen as the sea level rises in the coming years

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7.5 Overall Future Impact on the Local Authority

For each hazard and each impact category (Asset Damage, Health and Wellbeing, Environment, Social, Cultural Heritage, Financial, and Reputational), the projected level of impact has been estimated and the rationale for this provided. This future impact assessment accounts for projected changes in hazard, exposure and vulnerability and assumes that no additional adaptation actions are taken to offset future impacts. See **Appendix G** for the Future Impact Summary Matrix showing the projected impact versus the projected frequency for the future climate risks. The level of impact is calculated as the average level of impact across the impact categories of Asset Damage, Health and Wellbeing, Environment, Social, Financial, Reputation, and Cultural Heritage.

7.6 Future Climate Impacts Assessment Summary

After producing the Future Impact Summary Matrix, the future climate impacts of hazards projected to impact Wexford's Local Authority can be presented according to the future frequency and future level of impact of the hazard, see **Figure 7-1**. The level of future impact is calculated as the average level of impact across the impact categories of Asset Damage, Health and Wellbeing, Environment, Social, Financial, Reputation, and Cultural Heritage. This allows for the simple communication of the key risks that are projected for the County and how to prioritise them.

[44] CCC, EPA, UCC, DOECC. Fire, Land & Atmospheric, Remote Sensing of Emissions (FLARES). 2021

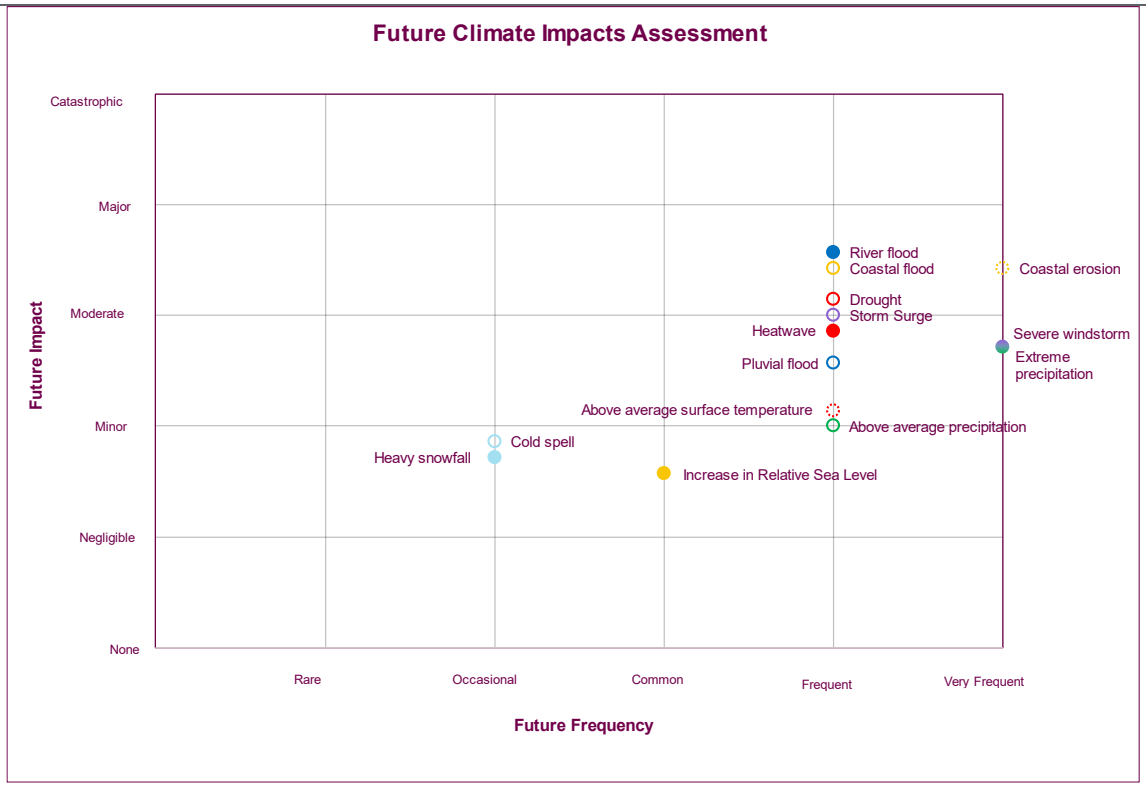

Figure 7-1: Future Climate Impacts Assessment Chart

8 SUMMARY AND CONCLUSION

This CCRA Report summarises the steps undertaken to assess the climate change risks within WCC. The more detailed tabular risk assessment outputs are included in the Appendices.

A CCRA is integral to informing the preparation of the Local Authority Climate Action Plan by identifying and prioritising current and future risks. It assists in the identification of possible adaptation responses to reduce or remove climate change risks within the Local Authority. Accordingly, the climate change risk assessment sits as part of the evidence base to support the local authority climate action plan.

As a Tier 1 qualitative study, this is a first-pass risk assessment to develop a broad understanding of climate change risk. It is intended to that this assessment provides the means to identify:

- a need for strategic and ongoing responses/ commitments
- key localities for attention and
- to build awareness of risk among community and senior management.

As it is a high-level screening, it is therefore not suitable for making any final decisions on adaptation actions but should be used to inform the general actions required.

Throughout this CCRA, the publicly accessible national level research, local level environmental and engineering research and reports, the workshop held with the input from WCC Service Areas, and the developed climate history formed the evidentiary basis for assessment.

Key Climate Hazards identified for County Wexford:

River Flooding

Coastal Flooding

Coastal Erosion

Future projections of climate change indicate that Extreme Precipitation, Prolonged Cold Periods and Heavy Snowfall will remain relatively consistent with existing conditions. However, risk is predicted to increase for all other identified climate hazards, with River Flooding remaining the perceived highest risk to County Wexford.

8.1 Recommendations

- To support the effective implementation and management of adaptation action, there is a need to transition from qualitative to semi-quantitative to quantitative approaches to risk assessment, with each step providing a greater level of information on which to base adaptation decisions
- It was noted during the workshop that most costs due to the resultant impacts of climate hazards are not typically budgeted for. It would be very helpful to provide a separate operational cost code for emergency or repair works due to certain climate hazard types for each service. This will allow the true cost of extreme weather events to be calculated and facilitate future contingencies in budgets and climate adaptation funding etc.
- The data gathering phase of this assessment identified that there is no systematic approach within Wexford County Council to record climate related observations and records in an indexed or easily accessible method. It would be recommended that all Service Areas within WCC and the Southeast sub-group of the East Midlands Region CARO adopt a consistent approach to recording service disruptions, mitigation, or recovery measures implemented, and associated costs for any areas within their remit. It is also recommended that WCC produce an annual summary report documenting all climate hazard impacts across all Service Areas.

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www.cso.ie

www.gsi.ie

www.floodinfo.ie

www.met.ie

Appendix A Risk Assessment Tiers

	First-pass risk assessment	Second-pass risk assessment	Third-pass risk assessment
Objective	Develop a quick high-level understanding of climate change risk to determine whether or not further research or adaptation planning is required at this time	Conduct a risk assessment (generally involving expert judgement) to identify specific risks that may become problematic under future climate change	Understand the vulnerability of different systems exposed to climate change-related hazards using more detailed and finer scale data; conduct a detailed risk assessment (quantitative or qualitative) to identify specific risks of different systems
Time and resource requirement	Minimum	Moderate	High
Data requirement	Nationally available datasets, which may be in published sources (e.g. summary regional projections and/or visualisations of climate and sea level variables). Available localised mapping and information. Data should be available at no cost	Nationally available climate change datasets, both observed and projected (e.g. from national meteorological centres), together with existing information available from government (e.g. local municipality) studies and/or expert knowledge. Data should be available at no or low cost	Some site-specific data (depending on the objective of the assessment and may not be necessary every time), e.g. lidar (light detection and ranging) data, in conjunction with high-resolution (daily, spatially explicit) climate scenario data and local expert knowledge to understand the exact scale of the risk. A substantial cost may be involved
Base knowledge requirement	• Minimum expertise required to acquire data • Local knowledge required to interpret data • Some understanding of climate change and its potential risks (readily available in many decision support tools such as Climate Ireland)	• Moderate knowledge required to acquire appropriate data • Moderate expertise required to interpret data • Moderate expertise required to understand the consequences of a specific climate risk	• High level of expertise required to acquire site-specific data (may not be necessary for all assessments) • High level of expertise required to apply data and analyse and interpret results • High level of expertise required to understand how a given climate risk can translate into a number of consequences for business
When should it be used?	• To develop a quick and broad understanding of climate change risk • To identify a need for strategic and ongoing responses/ commitments • To identify key localities for attention • To build awareness of risk among community and senior management • To seek a social and organisational licence to act on adaptation	• To develop a more detailed understanding of climate change risk and opportunities for a community or organisation • To identify key risk localities with follow-up resourcing requirements (e.g. new data, new study) • To get buy-in from community or senior management for developing an adaptation strategy or plan • To produce targeted climate risk communication materials • To identify adaptation options and support development of a plan or strategy	• To produce detailed impact studies of climate change effects on specific installations and activities, with a full understanding of the probabilities and uncertainties involved • To estimate the costs of adaptation action and prioritise resource allocation • To confirm emergency response procedures/requirements • To develop strategic and economic evaluations of adaptation options • To develop adaptation action plans for specific issues, including supporting detailed design
Limitations	Based on high-level screening and therefore not suitable for making any final decisions on adaptation actions	Based primarily on qualitative expert judgement of risk and therefore the results are as good as the qualitative judgement of the experts	Resource and time intensive, therefore requires expert input

Source: National Risk Assessment of Impacts of Climate Change: Bridging the Gap to Adaptation Action (EPA, 2020)

Appendix B Workshop Notes

Notes

Innishmore, Ballincollig
Co. Cork P31 KR68
T +353 21 466 5900

-=Reference:	IE000586A
Workshop Name:	CCRA Workshop Notes - Wexford County Council
Workshop date:	21 November 2022
Workshop location:	Wexford County Hall

Attendees

Name	Initials	Sector/Service
Billy Byrne	BB	Tourism
Abraham Dunne	AD	Roads
Micheal Brazzill	MB	Insurance Risk Management
Rory O'Mahoney	ROM	Environment
Hugh Russel	HR	Machinery Yard
Deirdre Kearns	DK	Forward Planning
Gary Duggan	GD	Water
Sean Savage	SS	Housing Capital
Neville Shaw	NS	Special Projects
Phil Murphy	PM	Environment
Caroline Creane	CC	Housing
Sean Kavanagh	SK	Housing
Tim Murphy	TM	Roads
Sinead Furlong	SF	Civil Defence
Liam Buckley	LB	I.T.
George Colfer	GC	Coastal/Environmental
Annamarie Colfer	AC	Finance
Susan Kelly	SK	Library Services (Gorey)
Ray Murphy	RM	Fire Services
Fionnuala Callery	FC	Water Services

Notes

Name	Initials	Sector/Service
Clare Kelly	CK	Climate Action
Tim Cooke	TC	RPS
James Peters	JP	RPS
Aidan Ware	AW	RPS

Climate Event History:

A discussion of the climate event history and the workshop attendee's recollection of significant effects and there impacts on services was used to kick off the workshop. The climate history was developed from the existing Climate Change Adaption Strategy covering events up to 2019 and additional events between 2019 and present day populated by members of the Climate Action Group prior to the workshop. The below notes outline the relevant climate events and impacts on services discussed during this period of the workshop:

- 2018 there were areas on alert for flooding.
- 2022 flooding in Gorey (Pluvial Event) caused significant flooding of the M11 resulting in 4-5hrs of significant traffic delays approximately 4.30pm to 9.00pm.
    - 3-4km of tailbacks with nowhere to go for cars stuck between exists.
    - The cause of this event was due to surface water runoff from adjacent land banks getting onto the road and being retained within the road structure and drainage infrastructure did not have sufficient capacity to deal with it.
    - Gorey town itself also has some fluvial flooding at the same time which exacerbated the issue.
    - Emergency services required for the immediately impacted areas as well as areas around to deal with the impacts, fire services tied up to rescue cars trapped in flood water putting pressure on responding to other emergency calls.
    - There was little to no advanced warning of the flooding of the M11 and localised areas in Gorey as such vehicle movement moved into the areas continued when they should have been stopped and re-directed before they got stuck in the flooded areas.
    - There was no warning mechanism utilised to alert people of the flooding to allow them to avoid flooded areas or communication from the TII of the issue. While VMS boards are in place TII did not put-up warnings of provide information to local or national media to alert the public of the issue. Communication of flooding was mainly through word of mouth and once WCC became aware started issuing warnings via local media channels.
    - The fact that WCC does not have responsibility for this road means they are solely reliant on communications from TII notify them of any significant issues and rely on TII to update the VMA system to warn motorists.
    - Due to the localised nature of the rainfall and resultant flooding there was no rainfall warning in place from Met Eireann as such it caught people off guard and with little to no advanced warning.
- Christmas Period of 2021 there was widespread flooding (fluvial flooding but exacerbated/caused by intense rainfall event) that resulted in widespread and significant damage to infrastructure.
    - A total of 12 bridge structures were damaged during this event (mostly masonry arch bridges). 7 of these masonry arch bridges incurred significant damage, some collapsed, to an extent they could not be used without significant repair with 3 of these still out of service and temporary bridge structures in place.
    - 12km of road surface was significantly damaged across the county mostly consisting of local roads.

Notes

- There impact of the damage caused was mostly localised in nature impacting rural areas to a greater degree with limited impact on the overall primary transport network.
- The immediate flooding event lasted a period of approximately 14hrs with significant man hours used up over this initial period and even more in the aftermath and clean up effort. Initial cost of approx. €250,000 and almost €4 million to date to repair damage for this event alone.
- There was a significant amount of damage to domestic properties and a lot of properties cut off due to damaged road infrastructure.
- Extreme and intense rainfall during this period and others like it results in significant environmental impacts form run off from agricultural land run off which makes its way into waterways as well as storm water network on the roads which ultimately will end up in wither a WWTP plant of disc arched to the environment.
- Abstractions for potable water supplies were flooded resulting in intakes becoming blocked which needed clearing and also resulted in water of poorer quality entering treatment facilities reducing the water quality of the supply to customers.
- It was mentioned that one of the WWTP is susceptible to flooding and impacts on the operation of the plant which results in a very large risk of discharging untreated/partially treated effluent to the environment.
- It was noted that the timing of this event was quite lucky as business were closed due to it being Christmas Day/Stephens Day as well as movement of people was drastically reduced. If this had been at any other time of year it would have resulted in significant amount of business closures as well as disruption to the transport infrastructure.
- Post COVID WFH is now more commonplace so events like this may not cause as much disruption as they would have in the past if people were prevented form travelling into their place of work.

- There has been increased pressures on water abstraction capacity for potable water supply due to longer dry spells and warmer weather as well as domestic wells been drying up. Largely the sources are replenished within one-cycle but ground water supplies are increasingly coming under pressure and most likely will become a bigger issue moving forward.
- IT representative was asked as to any significant impacts on IT services to date and he stated there were none to date.
- It was raised by other attendees of the reliance on the council services (besides emergency services who operate on TETRA radio network) on the mobile phone network for communications during emergency events in particular to mobilised crews. It was noted that during one storm event that the power to a communications tower was knocked out and communication was severely impact with no line of communication to the mobilised crews and personnel which represented a significant risk to their safety as well as safety of others who were reliant on the crews response. It was noted that while there is a VHF system that the council used to use but it is no longer in operation and the vans do not have radios or crews have handhelds, may be worth while looking into this as a aback up to build resilience to the communications in emergencies.
- Storm Emma (Beast form the East) 2018 was noted as one of the largest snow falls experienced in recent times with 2 large snow falls also in the winter of 2010.
- Quays of Wexford town and its streets in the low lying area of the town was very exposed to flooding events due to its location on the mouth of the river Slaney so it is exposed to fluvial and coastal flooding which can be exacerbated by storm surges and intense rainfall events. It was noted that this area is approx. 700mm below flood levels that have been experienced.
- Quay improvement works were completed in the mid 90's to alleviate this risk however perfect storm scenarios can result in the flood protection measures being overcome and significant flooding occurring with one notable event in October of 2004. The concern is going forward these "perfect" storm conditions could become more frequent.
- New Ross, located on the River Barrow, was also very suspectable to fluvial/river flooding. The flood elevation scheme in New Ross was completed in 2018 but again it was noted that since these works New ross has been subject to significant flooding due to the flood defences being overcome.

Notes

- Residential and commercial properties are significantly impacted during significant flood events and clean up can take a lot longer than the duration of the flood itself as well as the long-lasting effect on the owners mental health, anxiety levels increasing around bad weather events etc.
- Treatment Plant upgrade in 2023.

Climate Hazard Breakdown:

For the second stage of the workshop TC brought the attendees through the different hazard classifications identified for the county and the attendees were invited to identify the hazards impacts, exposures and vulnerabilities.

Windstorms:

- Risk to the general public safety as well as emergency responders and council crews being sent out in high winds, more extreme events pose more risks to health & safety.
- Public looky-loos going out to look at storm events a particular project in coastal areas during high winds is a exposure/vulnerability, out to watch the rough seas and waves in dangerous locations and result in public getting injured or in trouble wand needed rescuing etc.
- It was noted that during extreme weather events like windstorms homeless population needs to be catered for and taken off the street for their own safety, this is applicable across all weather events. WCC have a protocol in place to deal with this.
- Impact on water treatment plant intakes during high winds they tend to get blocked by debris in the water and increased intake of suspended solids into plant etc.
- Power outages at treatment plants is also a significant issue, not all plants have backup generators and once power soes supply of clean water to the network stops, this is exacerbated by the fact that a lot of the supply zones in Wexford County do not have sufficient emergency 24hrs storage in the network.
- Access to treatment sites (both water & wastewater) can be problematic during storm events due to blocked roads from trees and debris, if the operator can't get to the plant it may shut down or be treating to substandard quality.
- New Ross bridge (Rose Fitzgerald Kennedy Bridge) must be closed during high winds.
- High winds can also shut down harbour operations in the county.
- Tree falls during windstorms is an obvious impact and it was noted that during storm Ophelia there was 180+ trees downed on roads across the county.
- Swimming pool roof collapsed during Ophelia and there was a shutdown of nearly all public services during this period.
- Trees falling during windstorms is a higher vulnerability during prolonged spells of precipitation where the ground is saturated and the roots of the tress are not as strong and will up root a lot easier than in dryer conditions.

Pluvial Flooding:

- Can increase the amount debris entering rivers due to increased surface run off, this can increase flows in rivers and carry large debris downstream and cause significant damage to bridges and infrastructure in the rivers, outside of the acute impacts the long-term impacts of this occurring more often over time reduces the life span of infrastructure and can cause damage over time as well as immediate impacts.
- Build-up of leaves and other debris due to surface water run-off will block surface water drainage network which can exacerbate the extent of flooding caused.
- Existing storm systems that are in place are not designed for the extent of rainfall being experienced currently which is increasing the incidence of pluvial flooding as the existing networks cannot cope and become surcharged.
- The majority of the drainage network in the county is combined and surcharging of the networks results in sewerage mixed with the storm water exiting the network and being mixed in with the flood waters.

Notes

- Increased surface run-off during intense rainfall events leading to pluvial flooding entering water bodies decreases the water quality which can impact on water being abstracted for potable water supplies. Mostly due to turbidity but also nutrients entering from run-off from agricultural run-off.
- Run-off from agricultural lands can cause significant water quality issues during intense rainfall events, this can be exacerbated if the rainfall is preceded by a dry spell. This can have a big impact on bathing waters resulting in closures and impacting on council reputation.

River Flooding:

- The consensus of the workshop was that river flooding (which impacts services) is a frequent event.
- River flooding can result in the outfalls of combined networks becoming flooded and surcharging the network resulting in flooding events even if the river does not burst it banks and made worse by the fact it is contaminated flood water.
- Rail network in Enniscorthy can be impacted by river flooding and has resulted in closures in the past.
- Amenities on riverbanks are significantly affected especially walkways and trails and must be closed for public safety and can incur significant damage during river flooding events.
- There can be significant impact on agricultural lands during these flood events and can take long periods of times for flood waters to recced which can have a big impact on the industry. In addition, the contaminates entering the river from the flooded farmlands and all that comes with this.
- There are a large number of SAC's & SPA's within Wexford and river flooding can have a significant impact on these areas as well as natural habitats.
- Housing services for the homeless population must be provided during these flooding events and in addition temporary housing for those displaced form their homes, it was noted that this is not just from affected public housing but can have private homeowners coming for help also.

Coastal Flooding:

- Coastal winds cause significant risks to infrastructure and particularly access to coastal amenities, access points to beaches, piers, harbours etc being damaged due to winds or flooded due to coastal flooding etc.
- It was noted that Wexford has a "soft" coastline that is extremely susceptible to erosion and is an particular risk to infrastructure along the coast line as well as built and natural heritage, coastal amenities such as cliff walks, coastal path, beaches etc.
- There can be a trade-off between providing protection to the coastline and removing amenities along the coastline to facilitate these protection measures.
- A lot of the same issues with the other flooding impacts are of note here, it is worth noting Wexford Town is located at the mouth of the river Slaney and was very vulnerable to coastal flooding in the past, Quay wall improvements has mitigated this but still a risk during "perfect" storm conditions.

Heatwave:

- The frequency of a heatwave hazard event was increased to common frequency.
- Heatwaves will typically bring an increase pressure on coastal amenities with an influx of people from other counties to coastal areas which puts additional pressures on all services and infrastructure which can have an impact beyond the immediate coastal areas.
- Again, homeless population was mentioned, and they need to be taken care of and given access to adequate services by the council.
- There is an increased pressure on lifeguard services and coastal rescue services and emergency services due to significant increase of the numbers of people at coastal amenities, they would typically be used to dealing with much smaller and more manageable numbers but the volume of people flocking to the coats during heatwaves can exponentially increase.
- Significant increase to the risk of fires occurring across the board. Typical source of wild fires in Wexford is historically gorse fires but with increased temperatures and heatwaves there is increased concerns for fires in forestry as well as green spaces in urban areas.

Notes

- Increased use of areas for camping and the added risk of campfires going out of control or BBQ's in urban areas.
- Increased surface temperatures during heatwaves ca lead to issue with bitumen based road surfaced, in particularly surface dressed roads which are typically tertiary roads. Major road networks are typically cement bound macadam road surfaces which is not as susceptible to heat. Boiling of bitumen in surface dressed roads in rural areas is a big issue. Additionally concrete footpaths have expanded and heaved in extreme heat due to concrete mix used historically.
- Can also have a significant impact on the expansion of infrastructure which may cause damage.

Heavy Snowfall:

- It was noted that following heavy snowfalls the biggest issue is the time it takes to thaw, large snow drifts and thick layers of snow can freeze and if temperatures are slow to rise stay on the ground for weeks. As such there is a large demand on services to go out and physically remove the snow form the impacted areas.
- In 1982 there was a notable snowfall which immediately froze (similar in 90's and 2000's) and there was no increase in temp to thaw and resulted in much bigger an prolonged issues.
- Access to critical services can be difficult in these periods, WTP & WWTP's were noted as being difficult to get to and support required from emergency services to get operators to plants or to clear roads to get access.
- When the snow does thaws it can result in significant surface run-off and can end up causing all the same issues seen by pluvial flooding and intense rainfall events. How and where it drains to can cause significant issues and maybe even flooding in some cases.
- Weight of the snow on trees can increase their risk of falling and causing damage to powerlines, blocking roads etc.
- There is an increased risk of power line strikes during clearing of the snow and clear up activities by large plant.
- The representative from Civil Defence mentioned the importance of training and having suitably trained personnel to operate the vehicles/equipment that is at the council's disposal to aid in emergency events as a vulnerability. An example of having 4x4 vehicles available but nobody to drive them was given.
- School closures and their knock-on impact on the overall community and potential impacts on business and lost work due to parents having to stay at home etc.
- Businesses will also be significantly impacted and potential have to close but definite reduction in footfall/customers during heavy snow falls and possibly for a prolonged period if there is a slow thaw.

Sea Level Rise:

- It was noted that the impacts of this could be very similar to coastal flooding however the key difference here would be the permanent rise of sea levels and the subsequent impact rather than the acute rise during a flooding event.
- Major concern is the loss of land mass in areas affected by sea level rise and additionally incorporating the potential future scenarios into designing protection measures to prevent this.
- The trade-off between having to provide coastal adaptation works to prevent loss of land mass and the resultant loss of coastal amenities was brought up again.
- Due to increase seal levels the tidal rises are becoming higher which has a significant effect on coastal erosion of the areas of land susceptible to same.

Drought:

- "First Flush" due to rainfall following a drought significantly impacts on quality of surface water due to run-off and what gets into storm networks which are typically combined and can end up at treatment facilities or discharging directly to the environment.
- If storm water overflows are triggered during the "first flush" it can be a flow very concentrated with debris, contaminants etc entering the environment.

Notes

- During drought the dry weather flows to WWTP's become more concentrated and they experience very high organic loading due to the reduced flows into the plant as there is no dilution form ground water infiltration of flows form storm network in combined systems.
- From an agricultural perspective it can be catastrophic from a number as aspects:
  - Insufficient water for crop growth for food production.
  - Impact on growth of animal feed in particular reduced growth of grass for winter feed.
  - Accessibility of water for animals
  - Wider impact on agricultural industry and industries that rely on this industry.
- Drought will typically coincide with a heatwave and all the issues raised in this hazard can typically apply.
- Water supply can be significantly impacted due to stresses on abstraction sources, can be compounded by the fact a drought can coincide with a heatwave and as such demand on water can increase wile supply is also decreasing.

Above Average Surface Temps:

- Huge stresses on infrastructure for getting people to the sunny southeast to make the most of the good weather, especially when it can be relied upon and planned. All the problems that come with an influx of people to areas outside of the day-to-day population become an impact and puts severe stresses on services that the council provide across the board.

Significant Rainfall:

- De-stabilisation of coastal areas in particular cliff faces was raised as an issue.
- Again, homeless population mentioned and enacting the emergency action plan that WCC have in place.
- There is a very big issue with an increase in turbidity in water bodies and this directly impacts the quality of potable water supply when it impacts on abstraction for treatment facilities.

Above Average Precipitation:

- Saturated ground is more unstable which can lead to increased instability of soils and increases the risk of trees coming down.
- Saturated ground is more unstable which can lead to increased risk of land slides
- De-stabilisation of coastal areas in particular cliff faces can be increased by above average precipitation.

Cold Spell:

- Again, homeless population mentioned and enacting the emergency action plan that WCC have in place.
- Freezing pipes was raised as a big issue cause loss of water supply as well as flooding of areas and properties. A large amount of older water supplies are laid quite shallow and not below the frost line and results in significant and wise spread burst during prolonged cold spells.
- Process lines and chemical dosing lines freezing in treatment plants has caused issues in the past and prevent adequate treatment in WTP & WWTP.
- It was noted that the critical to the agriculture industry and wider industry that the roads are kept open and sufficiently treated to ensure everything keeps rolling.
- A significant issue with prolonged cold spells is the availability of resources over long periods of time and all this can entail, you are relying on the same pool of people to work long hours over long periods of time. Example was given of the fact the salting crews are the same crews relied upon to carry out day to day works on the roads so significantly impacts on normal maintenance and roads projects.

Storm Surge:

- Public looky-loos going out to look at storm events a particular project in coastal areas during high winds is a exposure/vulnerability, out to watch the rough seas and waves in dangerous locations and result in public getting injured or in trouble wand needed rescuing etc.
- Increased vulnerability during high tide especially spring tides.

Notes

- There can be a reliance on pumps for removal of flood waste from storm water pumping stations (even more a risk where flood relief scheme is in place) and if these get knocked out then the flooding can have a much higher impact.
- Navigation aids for marine can be damaged and impacted during these vents impacting on marine navigation.
- Damage across the board to marinas, docks, harbours and coastal infrastructure on a whole.
- There can be an impact on industries due to harbours and ports being in accessible or damaged during these events and vessels not being able to get in and out.
- Cancelation of ferries can have an impact on tourism industry.
- Damage to natural environment and habitats along the coast lines in addition to built and natural heritage.
- Again, the health and safety risk of mobilisation of emergency services and crews in these conditions, they are more extreme they are getting the higher the risk the people being sent out to respond are being exposed to. In addition, these are happing more frequently so increased incidence of call outs so naturally more chance of things going wrong.

Additional Comments:

It was noted that the majority of costs due to the resultant impacts of climate hazards are not typically budgeted for and it would be very helpful to provide a separate operational cost code for emergency or repair works due to certain events be provided to each service. This will allow the true cost of storm events and climate events to be calculated and facilitate future contingencies in budgets and climate adaptation funding etc.

Appendix C Hazard Events Record

Hazard Events Record - County Wexford				Hazard Type													
Year	Date	Event	Summary	River flood	Pluvial flood	Extreme precipitation	Severe windstorm	Storm Surge	Coastal Erosion	Coastal flood	Heavy snowfall	Heatwave	Drought	Above average surface temperature	Increase in Relative Sea Level	Above average precipitation	Cold spell
2022	2nd-4th November	Severe Weather	Extreme rainfall Event: Gorey, Courtown, Enniscorthy, Bunclody Flooded. 16 Roads flooded, 5 roads completely blocked including M11 motorway at J22/J23 Boil Water Notice issued for Wexford Town affecting 22,000 people. heavy rain impacted water quality. Low reservoirs led to supply interruptions and low pressure in Wexford over a number of days high wind and high tide damaged beach access at Kilpatrick. This access is used by 3 properties to access their house; at least one of the owners could not leave their property by car	■	■	■	■	■	■	■							
	2nd November	Mini Tornado	Clongeen/Foulksmills Mini Tornado causing damage to Houses & Farms				■										
	18th - 28th October	Rainstorm	Wexford Town Water Treatment plant shut down due to poor water quality and inability to treat. Led to low reservoir levels and monitoring for protozoa. Kilmallock WTPs impacted by raw water quality deterioration. Difficulty treating water at Bunclody Water Supply due to poor raw water quality. Tankering at high cost to maintain supply. poor raw water quality at surface water sources- increased monitoring for water quality			■											
	4th - 7th September	Storm Danielle	poor raw water quality at rivers serving Newtown and Kilmallock leading to supply risk. water quality deterioration, pH impacted			■											
	15th August	Flooding	New Ross Civil defence	■													
	August	Prolonged Dry period	Fire Danger Notices issued Dept Agriculture Water Shortage/Conservation notice issued in number of supplies in Wexford. A Thunderstorm caused an interruption at the treatment plant which led to a major supply outage impacting 13000 people and issues reported of animal welfare on farms										■				
	July	Heatwave	Prolonged extreme heat of 25-30°C. Extreme and prolonged temperatures, fire safety warnings issued by Fire Department and Department of Agriculture									■		■			
	March	Flood warning	Met Eireann National Orange flood Warning. SWAT meeting held. 43mm rain recorded at Mayglass rainfall station. Heavy rainfall event caused a deterioration in water quality that escalated over a number of days resulting finally in a boil water notice for Wexford town on 11th March and major supply outages due to difficulties with water supply affecting 22000 people. Also a BWN issued for Ballindaggin as rainfall caused major runoff from upland area which contaminated the well.			■											
	Feb	Storm Frankie					■										
	17-Feb	Storm Eunice	12000 homes/business without power in New Ross, Rosslare, Enniscorthy, Bunclody & Gorey Coastal Flooding Gusts up to 130km/hr Offshore winds 170km/hr, Fallen Trees blocked roads county wide including 1 no. fatality to council worker Electricity outages at multiple water supply sites, 5 generators needed. Major outage at Newtown WTP lead to major water supply disruption in Wexford town.				■	■	■	■							
	15-Feb	Storm Dudly	Status orange Wind warning				■										
2021	December	Pluvial & Fluvial Flooding & Tides	Significant flooding across co. Wexford. Initial flood related calls began approx. 9am on Christmas morning, with Emergency Services mobilising across the day to a range of calls across the county • Emergency Response ran until approx 10pm Christmas Day, with further flood management response continuing on St Stephens Day, in Enniscorthy • Bridgetown was most severely impacted by flooding. Blackwater, Foulksmills, Adamstown, Bree, Bunclody as well as many single incidences also reported around the county. The Slaney breached in Enniscorthy, with limited damage occurring due to flood prevention actions. Gorey area also impacted later in the day. SACFO coordinated on the ground for the majority of the day, liaising with various sections to respond to the volume of calls	■	■	■				■							
	6th December	Storm Barra	All areas on alert. Loss of power at multiple sites Also loss of communications signals. Southeasterly winds, mean speeds of 65 to 80 km/h with severe or damaging gusts of 100 to 130 km/h, with localised stronger winds likely, severe gusts on coasts. Due to a combination of high waves, storm surge and high tide, coastal flooding occurred.			■	■	■	■	■							
	28th October	Heavy Rainfall	91mm of rain over 4 days. Boil Water notice issued for Gorey, Wexford and Enniscorthy following river water quality deterioration impacting treatment			■											
	Summer	Heatwave & prolonged Dry period	loss of water supplies in private wells. Some supply interruptions due to high demand.									■	■				
2020	August	Storm Francis					■										
	Summer	Heatwave & prolonged Dry period	Hosepipe ban issued										■	■			
	Jan	Storm Brendan	All areas on alert Flood Barriers erected Arthurstown, New Ross High tide didn't pose issue Fire Service & Civil Defence on alert Stay aware from coastline	■			■										
2019	2nd October	Storm Lorenzo	All areas on alert				■										
2018	Dec	Storm Eric	All areas on alert				■										
	Dec	Storm Deirdre	All areas on alert				■										
	Nov	Storm Diana	All areas on alert				■										
	October	Storm Callum	All areas on alert				■										
	September	Storm Ali	Orange Wind Warning - gale-force winds of up to 120km/h, stormy conditions				■										
2018	Summer	High Temperatures, Heatwave & drought	High Temperatures, Heatwave and drought - disruption to water supply, issues with road maintenance etc.									■	■	■			

Hazard Events Record - County Wexford				Hazard Type														
Year	Date	Event	Summary	River flood	Pluvial flood	Extreme precipitation	Severe windstorm	Storm Surge	Coastal Erosion	Coastal flood	Heavy snowfall	Heatwave	Drought	Above average surface temperature	Increase in Relative Sea Level	Above average precipitation	Cold spell
	February/ March	Storm Emma & Beast from the East	Blizzard / Heavy Snowfall / widespread heavy snow drifting. Disruption to business, emergency services, power cuts etc. South east hit severely. Roof collapse in National Heritage Park due to snow loading. BWN issued for Enniscorthy due to water quality issue following heavy snowfall and pollution in river. Power loss at Edenvale and access issues due to snowfall impacted water supply for Wexford town and led to outages. Frozen pipes impacted supply. Multiple power outages. Difficulty with access to sites.				■				■						■
	Jan	Storm Eleanor	All areas on Alert				■										
2017	16th October	Storm Ophelia (Ex-Hurricane Ophelia)	Red warning - gale force winds, heavy rain and storm surges along some coasts (flooding). Disruption to business, power cuts etc. Johnstown castle station recorded gales force winds of 70km/h with gusts recorded of 115km/h at 13.35. Fallen tree leading to 1 no. fatality in road traffic accident.			■	■	■		■							
2016	8th February	Storm Imogen	Localised damage at Donnaghmore Ballygarrett. 3 properties adjacent to top of cliff Donaghmore partially collapsed, required demolition. Also cemetery at risk. Coastal protection works carried out to reduce risk.			■	■			■							
2015/2016	Dec/Jan	Storm Frank	Wettest January on record - 126% of monthly long term average Heavy Rain and Flooding. Severe Flooding in Enniscorthy town	■			■									■	
2014	11th/12th February	Storm Darwin	Red Warning for strong winds - classified a 1 in 20 year event. Wind speed 80-90km/h with Gusts 130-170km/h for Wexford Severe Flooding In New Ross town and Enniscorthy town Severe flooding in Wexford town	■		■	■										
2014	7th January	Coastal storm	Storm tides struck causing localised spot flooding in coastal and rural areas including Wellingtonbridge.Foulksmills, Newbawn, Clongeen, Slade, Dunmain, Horeswood, Fethard and Arthurstown Coastal erosion in Duncannon with 30 metres of the wall knocked down. Wellingtonbridge to Carrig on Bannow also suffered coastal erosion, also the flood wall on the road from Slade to Hook Head			■	■	■	■	■							
2013/14	Winter	Winter Storms	A combination of strong winds, tidal surges and low pressure conspired to cause widespread damage and flooding during the latter half of December 2013 and into the middle of February 2014. Serious coastal damage and widespread, persistent flooding.			■	■	■	■	■							
2011	September	Hurricane Katia	Met Eireann, issued an extreme weather warning amid predictions of storm gusts of up to 128 kph.				■	■									
2010	Winter	Snow	Extensive snowfalls and extremely low temperatures with daytime averages being below freezing.								■						■
2009/10	Winter	Winter Cold Spell	Coldest winter in almost 50 years (Met Eireann) with extreme low temperature recorded at Johnstown castle of -3.7oC Lowest temperatures on record in Dublin Airport (-8.4 degrees C) and Casemont Aerodrome (-9.1 degrees C) Important factors are the duration of the cold weather, how cold it was and how much snow. This particular cold spell was notable for being the earliest spell of significant duration (started in November). It was also notable for the sustained extreme low temperatures.								■						■
2009	November	Severe flooding	Rainfall totals were highest on record; extensive flooding Enniscorthy Quays and main Bridge Flooded	■	■	■											
2008	August	Heavy rain and flooding	Heavy rain and extensive flooding	■	■	■											
2006	Summer	High Temperature / Heat Wave	Warmest summer since record breaking 1996. Temp 31 deg C at casement Aerodrome on 19th July 2006 (may have been exceeded by 2018)									■		■			
2004	October	High Tides & Gales	Close to 200 businesses were affected by the worst flooding in Wexford town in over fifty years. Premises suffered flood damage, huge amounts of stock were lost, and computer systems crashed as the water level rose by 5ft more than normal, wreaking unstoppable havoc in many areas of the town. Extremely low-pressure storm passed over with a South Easterly wind that kept the tide levels artificially high in the harbour. Severe flooding in Dungarvan and in terms of council assets, the staff car park flooded to a height of 1.2m and cars floated, the same car park also housed archives and there was a large loss of files, the ground floor of the Motor Tax Building flooded causing extensive damage and a new twin 350mm rising main was washed out along the Greenway and cost €1m to replace. This had not yet been commissioned, reducing the environmental impact.				■	■		■				■			
2002	14th November	Heavy rain and severe flooding	Severe flooding in eastern areas. Wettest month on record at Casemont Aerodrome. River Slaney in Enniscorthy Co. Wexford burst its banks causing hundreds of thousands euro of damage.	■	■	■	■									■	
2002	1st February	Coastal Flooding	Eastern and southern coasts - highest tide in 80 years. Gale-force winds combined with the 9 a.m. high tide sent up to two feet of water on to both the north and south quays of New Ross town.			■	■	■		■					■		
2000	5th November	Severe Flooding	11-142mm rainfall Wicklow/Dublin & 70-98mm rainfall Tipperary / Waterford. Flooding of Enniscorthy town, localised flooding in rural areas	■	■	■				■							
1997	24th December	Windstorm	Gusts up 90mph				■										
1997	3rd – 7th August	Extreme rainfall and Flooding	Persistent rainfall in South East 3rd – 7th August Most affect areas included Blackwater and Cahore , Co. Wexford.		■	■										■	
1995	Summer	High Temperatures, Heatwave & drought	Warmest Summer on record. Mean temperatures over 2 degrees C above normal. Temp rises to 30 degrees C over a number of consecutive days.									■	■				
1991	January	Windstorm	Max gusts of up to 118km/h recorded in Rosslare				■										
1989	Decemb er	Windstorm & Coastal Flooding	Strong gales and heavy flooding at Kilmore Quay. 3 trawlers were destroyed, and remainder of fishing fleet was damaged to a varying degree. A 130ft hole appeared in the pier wall. The lightship broke its moorings.				■	■	■	■							
1987	12th-13th January	Heavy Snowfall	6 -10cm snow recorded in South east								■						■

Hazard Events Record - County Wexford				Hazard Type													
Year	Date	Event	Summary	River flood	Pluvial flood	Extreme precipitation	Severe windstorm	Storm Surge	Coastal Erosion	Coastal flood	Heavy snowfall	Heatwave	Drought	Above average surface temperature	Increase in Relative Sea Level	Above average precipitation	Cold spell
1986	August	Hurricane Charley	Strong winds and rain, worst flooding in 100 years	■	■	■	■	■	■	■							
1924/1925	Winter	Storm Surge & Coastal Erosion	The Rosslare Spit was destroyed in the storm of 1925. The Spit was eight kilometres long, almost touching Raven Point. The sea breached the spit and washed it away, creating an island. Over the next few years, sediment continued to be washed away, and now only pieces of the spit are visible during low tides.						■	■							

Appendix D Characterisation of Climate Hazards, Impacts, Exposures, Vulnerabilities and Assessment

Hazard Event:	**River Flood**
Frequency of Occurrence:	Common
Description of the Hazard Event: (Including relevant meteorological / climatological conditions and locations affected)	Rivers exceeding the capacity of their river banks. Bursting of river banks. Riverside infrastructure particulalry affected.

Hazard Impact	Impact Description:	Exposure	Vulnerability		Service Areas: Level of Disruption																		Impact Score
			Type	Description	Archives	Arts and Culture	Business and Economy	Community	Emergency Services	Environment	Finance	Governance and Administration	Built Heritage and Conservation	Housing	Human Resources	Information Technology	Leisure and Recreation	Libraries and Museums	Planning and Building	Roads and Transport	Tourism	Water Supply and Treatment	Coastal	
Damage to infrastructure	Flood water affecting built environment. Can lead to closure of facilities	LA buildings	Physical	Use of material Built Heritage Fixed or manual flood defences Flooded outfalls Structural loading	None	None	Negligible	None	None	None	Minor	None	Minor	None	Negligible	Minor	None	None	Minor	None	None	None	None	0.53
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area Proximity to rivers																			
			Socioeconomic	-																			
		Roads & Bridges	Physical	Use of material Built Heritage Structural loading	None	None	None	None	None	None	Negligible	None	Minor	None	None	None	None	None	None	Moderate	None	None	None	0.32
			Environmental	Proximity to rivers																			
			Socioeconomic	-																			
		Railway	Physical	-	None	None	None	None	None	None	Negligible	None	None	None	None	None	None	None	None	Moderate	None	None	None	0.21
			Environmental	Proximity to rivers																			
			Socioeconomic	-																			
		Housing	Physical	Use of material Built Heritage Fixed or manual flood defences Flooded outfalls Structural loading	None	None	None	Negligible	None	None	Minor	None	None	Moderate	Negligible	None	None	None	None	None	None	None	None	None	0.37
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area Proximity to rivers																			
			Socioeconomic	-																			
		Construction sites	Physical	Security of materials Silt netting	None	None	Minor	None	None	None	Negligible	None	None	None	None	None	None	None	Minor	None	None	None	None	0.26
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area Proximity to rivers																			
			Socioeconomic	-																			
		Commerce	Physical	Storage of stock/ equipment	Negligible	None	Minor	None	None	None	Negligible	None	None	None	None	Minor	None	None	None	None	Minor	None	Moderate	0.58
			Environmental	Proximity to rivers																			
			Socioeconomic	-																			
		Agricultural land	Physical	Efficiency of drainage network Flooded outfalls	None	None	Minor	None	None	Negligible	Negligible	None	None	None	None	None	None	None	None	None	None	None	None	0.21
			Environmental	Proximity to rivers																			
			Socioeconomic	-																			
		Drainage networks	Physical	Capacity Build up of silt	None	None	None	None	None	Minor	Negligible	None	None	None	None	None	None	None	None	None	None	None	None	0.16
			Environmental	-																			
			Socioeconomic	-																			
		Harbour	Physical	Ground level relative to surrounding area	None	None	Moderate	Minor	None	None	Negligible	None	None	None	None	None	Minor	None	None	None	Moderate	None	Moderate	0.74
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area																			
			Socioeconomic	-																			
		Land use suitability	Physical	Adequacy pf drainage network	None	None	None	None	None	None	Negligible	None	None	None	None	None	None	None	Minor	None	None	None	None	0.16
			Environmental	Proximity to rivers																			
			Socioeconomic	-																			
		Power supply	Physical	Fixed or manual flood defences Flooded outfalls Structural loading Backup generator availability	Negligible	Negligible	Major	Minor	Minor	Negligible	Minor	Negligible	Negligible	Negligible	Minor	Moderate	Negligible	Negligible	Negligible	Moderate	Negligible	Moderate	Negligible	1.68
			Environmental	Ground elevation and gradient relative to surrounding area Proximity to rivers																			
			Socioeconomic	-																			
Damage to environment	Loss of biodiversity	SAC/SPA/natural habitats	Physical	Flora sensitivity to saturation Anchorage of flora	None	None	None	None	None	Major	Negligible	None	None	None	None	None	None	None	Minor	None	None	None	None	0.37
			Environmental	Ground elevation and gradient relative to surrounding area Proximity to rivers																			
			Socioeconomic	-																			
Damage to riverside amenities	Damage to amenities on riverbanks, leading to closure for public safety	Walkways and trails	Physical	-	None	None	None	Minor	None	None	Negligible	None	None	None	None	None	Minor	None	None	None	Minor	None	None	0.37
			Environmental	Ground elevation and gradient relative to surrounding area Proximity to rivers																			
			Socioeconomic	-																			
Unuseable roads	Roads will become inundated with water and become inaccessable	Road network	Physical	Efficiency of drainage network Flooded outfalls	None	None	Negligible	Negligible	Moderate	None	Negligible	Negligible	None	None	None	None	Negligible	None	Negligible	Moderate	Negligible	None	None	0.68
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area Proximity to rivers																			
			Socioeconomic	-																			
		Pathways/ cycle lanes	Physical	Drainage network	None	None	None	Minor	None	None	Negligible	None	None	None	None	None	Minor	None	Negligible	Moderate	Negligible	None	None	0.53
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area Proximity to rivers																			
			Socioeconomic	-																			
		General public	Physical	-	None	None	None	None	None	None	Negligible	None	None	None	None	None	Negligible	None	Negligible	None	Minor	None	None	0.26
			Environmental	Road concestion																			
			Socioeconomic	Exposure to warnings/ alerts																			
		Emergency responders	Physical	-	None	None	Minor	None	Major	None	Negligible	None	None	None	None	None	None	None	None	None	None	None	None	0.37
			Environmental	Road concestion																			
			Socioeconomic	Reliance on TII for alerts on National roads Extended workload and overtime leading to burnout and availability of monitoring staff																			

Hazard Impact	Impact Description:	Exposure	Vulnerability		Service Areas: Level of Disruption																			
			Type	Description	Archives	Arts and Culture	Business and Economy	Community	Emergency Services	Environment	Finance	Governance and Administration	Built Heritage and Conservation	Housing	Human Resources	Information Technology	Leisure and Recreation	Libraries and Museums	Planning and Building	Roads and Transport	Tourism	Water Supply and Treatment	Coastal	Impact Score
Reduced water quality	Foreign substances entering water systems. Boil water notices issued in some cases	Water bodies	Physical	Sewage overflow inputs into water bodies Water turbidity Combined foul and surface system	None	None	Negligible	None	None	Major	Negligible	None	None	None	None	None	None	None	None	None	None	Major	None	0.53
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area Proximity to rivers																				
			Socioeconomic	-																				
		Water supply distribution	Physical	Back up generator availability	None	None	Negligible	Negligible	None	None	Minor	None	None	Negligible	Negligible	None	None	None	None	None	None	Major	None	0.53
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area Proximity to rivers																				
			Socioeconomic	Extended workload and overtime leading to burnout and availability of monitoring staff Resoonsibility (Irish Water)																				
Inundated wastewater treatment systems	Private systems located in poor drainage areas and/or flood zones become inundated	Wastewater infrastructure	Physical	Capacity and fullness of septic tanks	None	None	None	Minor	None	None	Minor	None	None	None	None	None	None	None	Minor	None	None	Major	None	0.53
			Environmental	Water table level Proximity to rivers																				
			Socioeconomic	-																				
Temporary housing	Relocation of homeless and residents of flooded properties	General public	Physical	-	None	None	None	None	None	None	Negligible	Negligible	None	Moderate	Minor	None	Negligible	None	None	None	Minor	None	None	0.53
			Environmental	Proximity to rivers																				
			Socioeconomic	Population age Population constitution Housing availability																				
		LA staff	Physical	-	None	None	None	None	None	None	Negligible	Negligible	None	Moderate	Minor	None	None	None	None	None	Negligible	None	None	0.42
			Environmental	Proximity to rivers																				
			Socioeconomic	Population age Population constitution Housing availability																				
		Homeless	Physical	-	None	None	None	None	None	None	Negligible	Negligible	None	Moderate	Minor	None	None	None	None	None	None	None	None	0.37
			Environmental	Proximity to rivers																				
			Socioeconomic	Population age Population constitution Housing availability																				
Health and Safety risks	Drowning/ presence of submerged hazards leading to injury or death	General public	Physical	-	None	None	Minor	None	Minor	None	Negligible	None	None	None	None	None	Negligible	None	None	None	Minor	None	None	0.42
			Environmental	Proximity to rivers																				
			Socioeconomic	Human desire to watch the event from an unsafe location Population age Population constitution Exposure to warnings/ alerts																				
		LA staff	Physical	-	None	None	Minor	None	Minor	None	Negligible	Negligible	None	None	None	None	None	None	Negligible	None	None	None	None	0.37
			Environmental	Proximity to rivers																				
			Socioeconomic	Population age Population constitution																				
		Homeless	Physical	-	None	None	None	None	Minor	None	Negligible	None	None	None	None	None	None	None	None	None	None	None	None	0.16
			Environmental	Proximity to rivers																				
			Socioeconomic	Population age Population constitution																				
Cancellation/ postponing of cultural events	Adverse weather disrupting ability to hold a cultural event	Cultural events	Physical	-	None	Moderate	Negligible	None	None	None	Negligible	None	None	None	None	None	Negligible	None	None	None	Minor	None	None	0.42
			Environmental	Proximity to rivers																				
			Socioeconomic	-																				

Hazard Event:	**Extreme Precipitation**
Frequency of Occurrence:	Frequent
Description of the Hazard Event: (including relevant meteorological / climatological conditions and locations affected)	An unusually large volume of rainfall in a short period of time. Red Warning 70mm or greater in 24 hours. Orange Warning 50-70mm in 24 hours. Yellow Warning 30-50mm in 24 hours.

Hazard Impact	Impact Description:	Exposure	Vulnerability		Service Areas: Level of Disruption																		Impact Score
			Type	Description	Archives	Arts and Culture	Business and Economy	Community	Emergency Services	Environment	Finance	Governance and Administration	Built Heritage and Conservation	Housing	Human Resources	Information Technology	Leisure and Recreation	Libraries and Museums	Planning and Building	Roads and Transport	Tourism	Water Supply and Treatment	Coastal	
Flooding	Excessive rainfall resulting in flooding, causing damage. Can lead to closure of facilities	LA buildings	Physical	Use of material Built Heritage Fixed or manual flood defences Flooded outfalls Structural loading	Minor	None	Negligible	None	None	None	Minor	None	Minor	None	Negligible	Minor	None	None	Negligible	None	None	None	None	0.58
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area Proximity to urban environment																			
			Socioeconomic	-																			
		Roads & Bridges	Physical	Use of material Built Heritage Adequacy of drainage systems	None	None	None	None	None	None	Negligible	None	Minor	None	None	None	None	None	None	Moderate	None	None	None	0.32
			Environmental	Faster rate of deterioration in roads due to prolonged exposure of road surfaces to flooding																			
			Socioeconomic	-																			
		Housing	Physical	Use of material Built Heritage Fixed or manual flood defences Flooded outfalls Structural loading	None	None	None	Negligible	None	None	Minor	None	None	Moderate	Negligible	None	None	None	None	None	None	None	None	None	0.37
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area Proximity to urban environment																			
			Socioeconomic	-																			
		Construction sites	Physical	Security of materials Silt netting	None	None	Minor	None	None	None	Negligible	None	None	None	None	None	None	None	Negligible	None	None	None	None	0.21
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area Proximity to urban environment																			
			Socioeconomic	-																			
		Commerce	Physical	Storage of stock/ equipment	Negligible	None	Minor	None	None	None	Negligible	None	None	None	None	Minor	None	None	None	None	Minor	None	Moderate	0.58
			Environmental	Proximity to urban environment																			
			Socioeconomic	-																			
		Drainage networks	Physical	Capacity Build up of silt	None	None	None	None	None	Minor	Negligible	None	None	None	None	None	None	None	None	None	None	None	None	0.16
			Environmental	-																			
			Socioeconomic	-																			
		Harbour	Physical	Presence of coastal defences	None	None	Moderate	Minor	None	None	Negligible	None	None	None	None	None	Minor	None	None	None	Moderate	None	Moderate	0.74
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area																			
			Socioeconomic	-																			
		SAC/SPA/natural habitats	Physical	Flora sensitivity to saturation Anchorage of flora	None	None	Minor	None	None	Moderate	Negligible	None	None	None	None	None	None	None	Minor	None	None	None	None	0.42
			Environmental	Ground elevation and gradient relative to surrounding area Proximity to urban environment																			
			Socioeconomic	-																			
		Agricultural land	Physical	Efficiency of drainage network Flooded outfalls	None	None	Minor	None	None	Negligible	Negligible	None	None	None	None	None	None	None	None	None	None	None	None	0.21
			Environmental	Proximity to urban environment																			
			Socioeconomic	-																			
		Land use suitability	Physical	Adequacy of drainage network	None	None	None	None	None	None	Negligible	None	None	None	None	None	None	None	Minor	None	None	None	None	0.16
			Environmental	Proximity to urban environment																			
			Socioeconomic	-																			
Unuseable roads	Roads will become inundated with water and become inaccessable	Road network	Physical	Efficiency of drainage network	None	None	None	Minor	Minor	None	Minor	None	None	None	None	None	Minor	None	Negligible	Moderate	Negligible	None	None	0.68
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area Proximity to urban environment																			
			Socioeconomic	-																			
		Pathways/ cycle lanes	Physical	-	None	None	None	Minor	None	None	Negligible	None	None	None	None	None	Minor	None	Negligible	Moderate	Minor	None	None	0.58
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area Proximity to urban environment																			
			Socioeconomic	-																			
		General public	Physical	-	None	Negligible	Minor	Minor	Minor	None	Negligible	None	None	None	None	None	Negligible	None	Negligible	None	Minor	None	None	0.63
			Environmental	Road congestion																			
			Socioeconomic	Exposure to warnings/ alerts																			
		Emergency responders	Physical	-	None	None	Moderate	Minor	Moderate	None	Negligible	None	None	None	None	None	None	None	None	None	None	None	None	0.47
			Environmental	Road congestion																			
			Socioeconomic	Reliance on TII for alerts on National roads Extended workload and overtime leading to burnout and availability of monitoring staff																			
Reduced water quality	Washed out nutrients/chemicals from surface run off entering water bodies. Boil water notices issued in some cases	Water bodies	Physical	Sewage overflow inputs into water bodies Gradient of ground Water turbidity Capacity	None	None	None	None	None	Moderate	Negligible	None	None	None	None	None	None	None	None	None	None	Major	None	0.42
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area Proximity to urban environment																			
			Socioeconomic	-																			
		Water supply distribution	Physical	Increase in peak flows Back up generator availability	None	None	None	Minor	None	None	Negligible	None	None	None	None	None	None	None	None	None	None	Major	None	0.37
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area Proximity to urban environment																			
			Socioeconomic	Extended workload and overtime leading to burnout and availability of monitoring staff Responsibility (Irish Water)																			
Inundated wastewater treatment systems	Private systems located in poor drainage areas and/or flood zones become inundated	Wastewater infrastructure	Physical	Capacity and fullness of septic tanks	None	None	None	Minor	None	None	Minor	None	None	None	None	None	None	None	Minor	None	None	Major	None	0.53
			Environmental	Water table level Proximity to urban environment																			
			Socioeconomic	-																			

Hazard Impact	Impact Description:	Exposure	Vulnerability		Service Areas: Level of Disruption																			
			Type	Description	Archives	Arts and Culture	Business and Economy	Community	Emergency Services	Environment	Finance	Governance and Administration	Built Heritage and Conservation	Housing	Human Resources	Information Technology	Leisure and Recreation	Libraries and Museums	Planning and Building	Roads and Transport	Tourism	Water Supply and Treatment	Coastal	Impact Score
Health and Safety risks	Heavy rain affects safe travel and poses a risk of injury from uncertain footing	General public	Physical	-	None	Negligible	Minor	Minor	Minor	None	Negligible	None	None	None	None	None	Negligible	None	Negligible	None	None	None	None	0.53
			Environmental	Available cover Proximity to urban environments Adequacy of drainage systems																				
			Socioeconomic	Population age Population constitution																				
		Council staff	Physical	-	None	None	Moderate	None	Moderate	None	Negligible	Negligible	None	None	None	None	None	Negligible	Negligible	None	None	None	None	0.53
			Environmental	Available cover Proximity to urban environments Adequacy of drainage systems																				
			Socioeconomic	Population age Population constitution																				
		Outdoor workers	Physical	Transport method used	None	None	Minor	Minor	Minor	None	Negligible	None	None	None	None	None	None	None	None	None	None	None	None	0.37
			Environmental	Available cover Proximity to urban environments Adequacy of drainage systems																				
			Socioeconomic	Population age Population constitution																				
Land erosion	Rainfall causing ground saturation, weakening ground strength	Saturated cliffs	Physical	Soil properties	None	None	None	Minor	None	Moderate	Negligible	None	None	None	None	None	None	None	Minor	None	None	None	Moderate	0.58
			Environmental	Ground elevation and gradient relative to surrounding area Proximity to urban environment																				
			Socioeconomic	-																				
Erosion of structures	Chemical reaction dissolving structures/ scour	LA buildings	Physical	Use of material Built Heritage	None	None	None	None	None	None	Negligible	None	Minor	None	None	None	None	None	None	None	None	None	None	0.16
			Environmental	-																				
			Socioeconomic	-																				
		Road network	Physical	Use of material Built Heritage	None	None	Negligible	None	None	None	Negligible	None	None	None	None	None	None	None	None	Moderate	None	None	None	0.26
			Environmental	-																				
			Socioeconomic	-																				
		Housing	Physical	Use of material Built Heritage	None	None	None	None	None	None	Negligible	None	None	Minor	None	None	None	None	None	None	None	None	None	0.16
			Environmental	-																				
			Socioeconomic	-																				
Cancellation/ postponing of cultural events	Adverse weather disrupting ability to hold a cultural event	Cultural events	Physical	Available cover	None	Moderate	Negligible	None	None	None	Negligible	None	None	None	None	None	Negligible	Negligible	None	None	Minor	None	None	0.47
			Environmental	Proximity to urban areas																				
			Socioeconomic	-																				

Hazard Event:	**Severe Windstorm**
Frequency of Occurrence:	Very frequent
Description of the Hazard Event: (Including relevant meteorological / climatological conditions and locations affected)	Red Warning indicating mean gusts >80km/h. Gusts in excess of 130km/h Orange Warning indicating mean gusts of 65-80km/h. Gusts ranging between 110-130km/h Yellow Warning indicating mean gusts of 50-65km/h. Gusts ranging between 90-110km/h

Hazard Impact	Impact Description:	Exposure	Vulnerability		Service Areas: Level of Disruption																			
			Type	Description	Archives	Arts and Culture	Business and Economy	Community	Emergency Services	Environment	Finance	Governance and Administration	Built Heritage and Conservation	Housing	Human Resources	Information Technology	Leisure and Recreation	Libraries and Museums	Planning and Building	Roads and Transport	Tourism	Water Supply and Treatment	Coastal	Impact Score
Damage to infrastructure	Wind causing damage to infrastructure. Can lead to closure of facilities	LA buildings	Physical	Use of material Built Heritage Structural loading Building heights	Negligible	None	Moderate	Minor	None	None	Minor	None	Moderate	Minor	Negligible	None	None	Minor	Negligible	None	Negligible	None	Major	1.16
			Environmental	Proximity to vegetation Wind tunnels in urban environments Proximity to coastal environments																				
			Socioeconomic	-																				
		Bridges	Physical	Use of material Built Heritage Structural loading	None	None	None	None	None	None	Minor	None	Moderate	None	None	None	None	None	None	Moderate	None	None	Minor	0.53
			Environmental	Proximity to coastal environments																				
			Socioeconomic	-																				
		Housing	Physical	Use of material Built Heritage Structural loading Building heights	None	None	None	Minor	Minor	None	Minor	None	None	Minor	None	None	None	None	None	None	None	None	None	None	0.42
			Environmental	Proximity to vegetation Wind tunnels in urban environments Proximity to coastal environments																				
			Socioeconomic	-																				
		Commerce	Physical	-	Negligible	None	Moderate	None	None	None	Negligible	Negligible	None	None	None	Negligible	None	Negligible	None	None	Moderate	None	Major	0.79
			Environmental	Proximity to vegetation Wind tunnels in urban environments																				
			Socioeconomic	Nature of business																				
		Telemetry	Physical	-	None	None	Moderate	Moderate	Moderate	None	Negligible	Negligible	None	None	Negligible	Moderate	Minor	Negligible	None	Minor	Minor	Minor	Moderate	1.42
			Environmental	Proximity to vegetation																				
			Socioeconomic	-																				
		Harbour	Physical	-	None	None	Moderate	Minor	None	None	Negligible	None	None	None	None	None	Minor	None	None	None	Moderate	None	Major	0.79
			Environmental	Level of exposure to wind																				
			Socioeconomic	-																				
		Water abstraction and wastewater infrastructure	Physical	Integrity of treatment plant infrastructure	None	None	None	None	None	None	Negligible	None	None	None	None	None	None	None	None	None	None	Moderate	Moderate	0.37
			Environmental	Proximity to vegetation																				
			Socioeconomic	-																				
Damage to environment	Loss of biodiversity	SAC/SPA/natural habitats	Physical	Integrity of habitats Available shelter	None	None	None	None	None	Moderate	Negligible	None	None	None	None	None	None	None	Minor	None	Minor	None	None	0.42
			Environmental	Level of exposure to wind																				
			Socioeconomic	-																				
Loose debris/material	Debris picked up by wind creating blockages and causing damage to infrastructure and population	LA buildings	Physical	Use of material Built Heritage	Negligible	None	Moderate	Minor	None	None	Negligible	None	Minor	Minor	None	None	None	Minor	Negligible	None	Negligible	None	Minor	0.89
			Environmental	Proximity to vegetation Wind tunnels in urban environments																				
			Socioeconomic	-																				
		Bridges	Physical	Use of material Built Heritage	None	None	None	None	Minor	None	Negligible	None	Minor	None	None	None	None	None	None	Moderate	Moderate	None	None	0.58
			Environmental	Proximity to vegetation Wind tunnels in urban environments																				
			Socioeconomic	-																				
		Construction sites	Physical	Use of material Security of materials Potential to compromise scaffolding	Negligible	None	Moderate	Minor	None	None	Negligible	None	None	Minor	None	None	None	None	Minor	None	None	None	None	0.58
			Environmental	Proximity to vegetation Wind tunnels in urban environments																				
			Socioeconomic	-																				
		Derelict buildings	Physical	Use of material Built Heritage	None	None	None	Minor	Minor	None	Negligible	None	None	None	None	None	None	None	Minor	None	None	None	None	0.37
			Environmental	Proximity to vegetation Wind tunnels in urban environments																				
			Socioeconomic	-																				
		Water treatment plants	Physical	Contamination prevention/ mitigation measures	None	None	None	None	None	None	Negligible	None	None	None	None	None	None	None	None	None	None	Moderate	None	0.21
			Environmental	Proximity to vegetation																				
			Socioeconomic	-																				
		Water bodies	Physical	Size of water body Contamination prevention/ mitigation measures	None	None	None	None	None	Moderate	Negligible	None	None	None	None	None	None	None	None	None	None	Moderate	Minor	0.47
			Environmental	Proximity to vegetation																				
			Socioeconomic	-																				
Health and Safety risks	High winds affect safe travel and poses a risk of injury	General public	Physical	-	None	Negligible	Minor	Minor	Moderate	None	Negligible	None	None	None	None	None	Negligible	None	None	None	None	None	Moderate	0.68
			Environmental	Available shelter Wind tunnels in urban environments																				
			Socioeconomic	Human desire to watch the event from an unsafe location Population age Population constitution Homeless																				
		Council staff	Physical	-	None	None	Moderate	None	Moderate	None	Negligible	Negligible	None	None	None	None	None	Minor	None	None	None	None	Minor	0.63
			Environmental	Available shelter Wind tunnels in urban environments																				
			Socioeconomic	Population age Population constitution																				
		Outdoor workers	Physical	Transport method used	None	None	Minor	Minor	Minor	None	Negligible	None	None	None	None	None	None	None	None	None	None	None	Minor	0.47
			Environmental	Available shelter Wind tunnels in urban environments																				
			Socioeconomic	Population age Population constitution																				
Land erosion	Loss of land leading to increased pressure on dune systems in coastal areas	Dunes	Physical	Soil properties Erosion mitigation measures	None	None	None	Minor	None	Moderate	Negligible	None	None	None	None	None	Negligible	None	None	None	Minor	None	Minor	0.58
			Environmental	Level of exposure to wind																				
			Socioeconomic	-																				

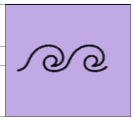
Hazard Impact	Impact Description:	Exposure	Vulnerability		Service Areas: Level of Disruption																			
			Type	Description	Archives	Arts and Culture	Business and Economy	Community	Emergency Services	Environment	Finance	Governance and Administration	Built Heritage and Conservation	Housing	Human Resources	Information Technology	Leisure and Recreation	Libraries and Museums	Planning and Building	Roads and Transport	Tourism	Water Supply and Treatment	Coastal	Impact Score
Reduced water quality	Saline intrusion of waters leading to contaminated drinking water	Water treatment plants	Physical	-	None	None	None	None	None	None	Negligible	None	None	None	None	None	None	None	None	None	Moderate	None	0.21
			Environmental	Proximity to coastal environments																			
			Socioeconomic	-																			
Power supply cuts	Damage to powerlines leading to loss of power to urban and regional centres	Commerce	Physical	Presence of overhead lines Backup generator availability	Negligible	None	Moderate	None	None	None	Negligible	None	None	None	None	None	None	None	None	None	Moderate	None	None	0.42
			Environmental	Proximity to vegetation																			
			Socioeconomic	-																			
		LA buildings	Physical	Presence of overhead lines Backup generator availability	Negligible	None	Moderate	Minor	None	None	Negligible	Negligible	Moderate	Minor	None	Minor	None	Minor	Negligible	None	Moderate	None	None	1.11
			Environmental	Proximity to vegetation																			
			Socioeconomic	-																			
		Housing	Physical	Presence of overhead lines Backup generator availability	None	None	None	Minor	Minor	None	Negligible	None	None	Minor	None	None	None	None	None	None	None	None	None	0.37
			Environmental	Proximity to vegetation																			
			Socioeconomic	Population age Population constitution																			
		Hospital/Health Centres	Physical	Presence of overhead lines Backup generator availability	Negligible	None	None	Minor	Moderate	None	Negligible	None	None	None	None	None	None	None	None	None	None	None	None	0.37
			Environmental	Proximity to vegetation																			
			Socioeconomic	-																			
		Communication/ servers	Physical	Presence of overhead lines Backup generator availability	Minor	Negligible	Minor	Minor	Major	Minor	Minor	Minor	Minor	Minor	Minor	Moderate	Negligible	Minor	Minor	Moderate	Moderate	Minor	Minor	2.16
			Environmental	Proximity to vegetation																			
			Socioeconomic	-																			
		Water and wastewater treatment plants	Physical	Presence of overhead lines Backup generator availability Emergency supply storage Overflow from wastewater systems due to power outage	None	None	None	None	Minor	None	Negligible	None	None	None	None	None	None	None	None	None	None	Moderate	None	0.32
			Environmental	Proximity to vegetation																			
			Socioeconomic	-																			
Falling trees/ branches	Wind destroying trees and carrying material leading to a variety of disruption to services	Outdoor workers	Physical	Personal Protective Equipment	None	Negligible	Moderate	Minor	Minor	None	Negligible	None	None	None	Minor	None	None	None	Minor	None	None	None	Minor	0.79
			Environmental	Influenced by time of year Proximity to/ volume of vegetation Available cover																			
			Socioeconomic	Population age Population constitution																			
		Emergency services	Physical	Personal Protective Equipment	None	Negligible	Moderate	Minor	Minor	None	Negligible	None	None	None	Minor	None	None	None	None	None	None	None	None	0.58
			Environmental	Influenced by time of year Proximity to/ volume of vegetation Available shelter																			
			Socioeconomic	Population age Population constitution																			
		Parks	Physical	Soil properties	None	None	None	Minor	None	Moderate	Negligible	None	None	None	None	None	Minor	None	None	None	Moderate	None	None	0.58
			Environmental	Influenced by time of year Proximity to/ volume of vegetation																			
			Socioeconomic	-																			
		Transport infrastructure including roads, rail, and pathways	Physical	Use of material Built Heritage	None	None	None	Minor	Minor	None	Negligible	None	None	None	None	None	Negligible	None	Negligible	Moderate	Minor	None	Minor	0.74
			Environmental	Influenced by time of year Proximity to/ volume of vegetation																			
			Socioeconomic	Remote working Alternate transport methods Reliance on TII for alerts on National roads																			
		Water and wastewater treatment plants	Physical	Debris manaoement measures	None	None	None	None	Minor	None	Negligible	None	None	None	None	None	None	None	None	None	None	Moderate	None	0.32
			Environmental	Influenced by time of year Proximity to/ volume of vegetation																			
			Socioeconomic	Extended workload and overtime leading to burnout and availability of monitoring staff																			
Cancellation/ postponing of cultural events	Adverse weather disrupting ability to hold a cultural event	Cultural events	Physical	Available shelter	None	Major	Negligible	Minor	None	None	Negligible	None	None	None	None	None	None	None	None	None	None	Minor	None	None	0.53
			Environmental	Level of exposure to wind																			
			Socioeconomic	-																			

Hazard Event:	**Pluvial Flood**
Frequency of Occurrence:	Common
Description of the Hazard Event: (Including relevant meteorological / climatological conditions and locations affected)	Period of wet weather resulting in saturated soils. Heavy precipitation levels causes surface water flooding. Precipitation levels exceeding historic levels.

Hazard Impact	Impact Description:	Exposure	Vulnerability		Service Areas: Level of Disruption																			Impact Score
			Type	Description	Archives	Arts and Culture	Business and Economy	Community	Emergency Services	Environment	Finance	Governance and Administration	Built Heritage and Conservation	Housing	Human Resources	Information Technology	Leisure and Recreation	Libraries and Museums	Planning and Building	Roads and Transport	Tourism	Water Supply and Treatment	Coastal	
Damage to infrastructure	Flood water affecting built environment. Can lead to closure of facilities	LA buildings	Physical	Use of material Built Heritage Adequacy of drainage network Flooded outfalls Structural loading	Moderate	None	Negligible	None	None	None	Minor	None	Minor	None	Negligible	Moderate	None	None	Minor	None	None	None	None	0.74
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area Proximity to vegetation																			
			Socioeconomic	-																			
		Roads & Bridges	Physical	Use of material Built Heritage Adequacy of drainage network Structural loading	None	None	None	None	None	None	Negligible	None	Minor	None	None	None	None	None	None	Moderate	None	None	None	0.32
			Environmental	Proximity to vegetation																			
			Socioeconomic	-																			
		Housing	Physical	Use of material Built Heritage Fixed or manual flood defences Flooded outfalls Structural loading	None	None	None	Negligible	None	None	Minor	None	None	Moderate	Negligible	None	None	None	None	None	None	None	None	None	0.37
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area Proximity to vegetation																			
			Socioeconomic	-																			
		Construction sites	Physical	Security of materials Silt netting	None	None	Minor	None	None	None	Negligible	None	None	None	None	None	None	None	Minor	None	None	None	None	0.26
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area Proximity to vegetation																			
			Socioeconomic	-																			
		Commerce	Physical	Storage of stock/ equipment	Negligible	None	Minor	None	None	None	Negligible	None	None	None	None	Minor	None	None	None	None	Minor	None	Moderate	0.58
			Environmental	Proximity to urban environment																			
			Socioeconomic	-																			
		Drainage networks	Physical	Capacity Build up of silt/leaves	None	None	None	None	None	Minor	Negligible	None	None	None	None	None	None	None	None	None	None	None	None	0.16
			Environmental	Proximity to vegetation																			
			Socioeconomic	-																			
		Harbour	Physical	Presence of coastal defences	None	None	Moderate	Minor	None	None	Negligible	None	None	None	None	None	Minor	None	None	None	Moderate	None	Moderate	0.74
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area																			
			Socioeconomic	-																			
		Agricultural land	Physical	Adequacy of drainage network Flooded outfalls	None	None	Minor	None	None	Negligible	Negligible	None	None	None	None	None	None	None	None	None	None	None	None	0.21
			Environmental	Proximity to urban environment																			
			Socioeconomic	-																			
		Power supply	Physical	Fixed or manual flood defences Flooded outfalls Structural loading Backup generators	Negligible	Negligible	Major	Negligible	Minor	Negligible	Negligible	Negligible	Negligible	Negligible	Minor	Moderate	Negligible	Negligible	Negligible	Moderate	Negligible	Moderate	Negligible	1.58
			Environmental	Ground elevation and gradient relative to surrounding area Proximity to urban environment																			
			Socioeconomic	-																			
Damage to environment	Loss of biodiversity	SAC/SPA/natural habitats	Physical	Flora sensitivity to saturation Anchorage of flora	None	None	None	None	None	Major	Negligible	None	None	None	None	None	None	None	Minor	None	None	None	None	0.37
			Environmental	Ground elevation and gradient relative to surrounding area Proximity to urban environment																			
			Socioeconomic	-																			
Unuseable roads	Roads will become inundated with water and become inaccessable	Road network	Physical	Efficiency of drainage network Flooded outfalls	None	None	Negligible	Negligible	Moderate	None	Negligible	Negligible	None	None	None	None	Negligible	None	Negligible	Moderate	Negligible	None	None	0.68
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area Proximity to urban environment																			
			Socioeconomic	-																			
		Pathways/ cycle lanes	Physical	Drainage network	None	None	None	Minor	None	None	Negligible	None	None	None	None	None	Minor	None	Negligible	Moderate	Negligible	None	None	0.53
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area Proximity to urban environment																			
			Socioeconomic	-																			
		General public	Physical	-	None	None	None	None	None	None	Negligible	None	None	None	None	None	Negligible	None	Negligible	None	Minor	None	None	0.26
			Environmental	Road congestion																			
			Socioeconomic	Exposure to warnings/ alerts																			
		Emergency responders	Physical	-	None	None	Minor	None	Major	None	Negligible	None	None	None	None	None	None	None	None	None	None	None	None	0.37
			Environmental	Road congestion																			
			Socioeconomic	Reliance on TII for alerts on National roads Extended workload and overtime leading to burnout and availability of monitoring staff																			
Reduced water quality	Vegetation debris or leachate from surface run off entering water systems. Boil water notices issued in some cases	Water bodies	Physical	Sewage overflow inputs into water bodies Water turbidity Combined foul and surface system	None	None	Negligible	None	None	Major	Negligible	None	None	None	None	None	None	None	None	None	None	Major	Moderate	0.68
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area Proximity to urban environment Proximity to agricultural land																			
			Socioeconomic	-																			
		Water supply	Physical	-	None	None	Negligible	Negligible	None	None	Negligible	None	None	Negligible	Negligible	None	None	None	None	None	None	Major	None	0.47
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area Proximity to urban environment																			
			Socioeconomic	Extended workload and overtime leading to burnout and availability of monitoring staff Resoonsibility (Irish Water)																			
Inundated wastewater treatment systems	Private systems located in poor drainage areas and/or flood zones become inundated	Wastewater infrastructure	Physical	Capacity and fullness of septic tanks	None	None	None	Minor	None	None	Minor	None	None	None	None	None	None	None	Minor	None	None	Major	None	0.53
			Environmental	Water table level Proximity to urban environment																			
			Socioeconomic	-																			

Hazard Impact	Impact Description:	Exposure	Vulnerability		Service Areas: Level of Disruption																		
			Type	Description	Archives	Arts and Culture	Business and Economy	Community	Emergency Services	Environment	Finance	Governance and Administration	Built Heritage and Conservation	Housing	Human Resources	Information Technology	Leisure and Recreation	Libraries and Museums	Planning and Building	Roads and Transport	Tourism	Water Supply and Treatment	Coastal	Impact Score
Temporary housing	Relocation of homeless and residents of flooded properties	General public	Physical	-	None	None	None	None	None	None	Negligible	Negligible	None	Moderate	Minor	None	Negligible	None	None	None	Minor	None	None	0.53
			Environmental	Proximity to urban environment																			
			Socioeconomic	Population age Population constitution Housing availability																			
		LA staff	Physical	-	None	None	None	None	None	None	Negligible	Negligible	None	Moderate	Minor	None	None	None	None	None	Negligible	None	None	0.42
			Environmental	Proximity to urban environment																			
			Socioeconomic	Population age Population constitution Housing availability																			
		Homeless	Physical	-	None	None	None	None	None	None	Negligible	Negligible	None	Moderate	Minor	None	None	None	None	None	None	None	None	0.37
			Environmental	Proximity to urban environment																			
			Socioeconomic	Population age Population constitution Housing availability																			
Health and Safety risks	Drowning/ presence of submerged hazards leading to injury or death	General public	Physical	-	None	None	Minor	None	Minor	None	Negligible	None	None	None	None	None	Negligible	None	None	None	Minor	None	Minor	0.53
			Environmental	Proximity to urban environment																			
			Socioeconomic	Human desire to watch the event from an unsafe location Population age Population constitution Exposure to warnings/ alerts																			
		LA staff	Physical	-	None	None	Minor	None	Minor	None	Negligible	Negligible	None	None	None	None	None	Minor	Negligible	None	Negligible	None	Minor	0.63
			Environmental	Proximity to urban environment																			
			Socioeconomic	Population age Population constitution																			
		Homeless	Physical	-	None	None	None	None	Minor	None	Negligible	None	None	None	None	None	None	None	None	None	None	None	None	0.16
			Environmental	Proximity to urban environment																			
			Socioeconomic	Population age Population constitution																			
Cancellation/ postponing of cultural events	Adverse weather disrupting ability to hold a cultural event	Cultural events	Physical	-	None	Moderate	Negligible	None	None	None	Negligible	None	None	None	None	None	Negligible	None	None	None	Minor	None	None	0.42
			Environmental	Proximity to urban environment																			
			Socioeconomic	-																			

Hazard Event:	**Storm Surge**
Frequency of Occurrence:	Common
Description of the Hazard Event: (Including relevant meteorological / climatological conditions and locations affected)	Strong winds, high tides, and low pressures resulting in widespread coastal damage. Coastal areas particularly affected.



Hazard Impact	Impact Description:	Exposure	Vulnerability		Service Areas: Level of Disruption																			Impact Score
			Type	Description	Archives	Arts and Culture	Business and Economy	Community	Emergency Services	Environment	Finance	Governance and Administration	Built Heritage and Conservation	Housing	Human Resources	Information Technology	Leisure and Recreation	Libraries and Museums	Planning and Building	Roads and Transport	Tourism	Water Supply and Treatment	Coastal	
Damage to infrastructure	Damage to infrastructure and built heritage due to high tide levels and strong winds	LA buildings	Physical	Use of material Built Heritage Coastal defences Structural loading	Negligible	None	Moderate	Minor	None	None	Minor	None	Minor	Minor	Negligible	None	None	Minor	Negligible	None	Negligible	None	Major	1.11
			Environmental	Ground elevation relative to sea level Proximity to coastal environment																				
			Socioeconomic	-																				
		Harbour	Physical	Use of material Built Heritage Coastal flood defences Structural loading Navigation aids	None	None	Moderate	Minor	None	None	Minor	None	Minor	None	None	None	Moderate	None	None	None	Moderate	None	Major	1.00
			Environmental	Elevation relative to sea level																				
			Socioeconomic	Cancelation of ferries																				
		Telemetry	Physical	-	None	None	Moderate	Moderate	Moderate	None	Minor	Negligible	None	None	Negligible	Moderate	Minor	Negligible	None	Minor	Moderate	Minor	Moderate	1.53
			Environmental	Proximity to vegetation																				
			Socioeconomic	-																				
		Commerce	Physical	Storage of stock/ equipment	None	None	None	None	None	None	Negligible	None	None	None	None	None	None	None	None	None	None	None	Moderate	0.21
			Environmental	Proximity to coastal environment																				
			Socioeconomic	-																				
		Power supply	Physical	Structural loading Backup generators	Negligible	Negligible	Major	Negligible	Minor	Negligible	Negligible	Negligible	Negligible	Negligible	Minor	Moderate	Negligible	Negligible	Negligible	Moderate	Negligible	Moderate	Negligible	1.58
			Environmental	Ground elevation and gradient relative to surrounding area Proximity to rivers																				
			Socioeconomic	-																				
Damage to environment	Erosion due to wind and exposure to seawater	SAC/SPA/natural habitats	Physical	Water turbidity Combined foul and surface system	None	None	None	Negligible	None	Major	Negligible	None	None	None	None	None	Moderate	None	Minor	None	Moderate	None	Major	0.95
			Environmental	Ground elevation relative to sea level Proximity to coastal environment																				
			Socioeconomic	-																				
		Coastline/Dunes	Physical	Soil/material properties Heritage Erosion mitigation measures	None	None	None	None	None	Major	Negligible	None	None	None	None	None	None	None	Minor	None	None	None	Major	0.58
			Environmental	Level of exposure to wind Elevation relative to sea level																				
			Socioeconomic	-																				
Reduced water quality	Sea water or debris entering water systems. Boil water notices issued in some cases	Water bodies	Physical	Water turbidity Combined foul and surface system	None	None	None	None	None	Moderate	Negligible	None	None	None	None	None	None	None	None	None	None	Moderate	None	0.37
			Environmental	Ground elevation relative to sea level Proximity to coastal environment																				
			Socioeconomic	-																				
		Water supply distribution	Physical	-	None	None	None	Minor	None	None	Negligible	None	None	None	None	None	None	None	None	None	Minor	Moderate	None	0.42
			Environmental	Ground elevation relative to sea level Proximity to coastal environment																				
			Socioeconomic	Extended workload and overtime leading to burnout and availability of monitoring staff Responsibility (Irish Water)																				
Loose debris	Debris picked up by wind causing damage to infrastructure and population	LA buildings	Physical	Use of material Built Heritage	Negligible	None	Moderate	Minor	None	None	Negligible	None	Minor	Minor	None	None	None	Minor	Negligible	None	Negligible	None	Minor	0.89
			Environmental	Proximity to vegetation Wind tunnels in urban environments																				
			Socioeconomic	-																				
		Bridges	Physical	Use of material Built Heritage	None	None	None	None	Minor	None	Negligible	None	Minor	None	None	None	None	None	None	Moderate	Minor	None	None	0.53
			Environmental	Proximity to vegetation Wind tunnels in urban environments																				
			Socioeconomic	-																				
		Construction sites	Physical	Use of material Security of materials	Negligible	None	Moderate	Minor	None	None	Negligible	None	None	Minor	None	None	None	None	Minor	None	None	None	Minor	0.68
			Environmental	Proximity to vegetation Wind tunnels in urban environments																				
			Socioeconomic	-																				
		Derelict buildings	Physical	Use of material Built Heritage	None	None	None	Minor	Minor	None	Negligible	None	Minor	None	None	None	None	None	Minor	None	None	None	None	0.47
			Environmental	Proximity to vegetation Wind tunnels in urban environments																				
			Socioeconomic	-																				
		People	Physical	-	None	Negligible	Minor	Minor	Major	None	Negligible	None	None	None	Minor	None	Negligible	None	Negligible	None	Minor	None	Moderate	1.00
			Environmental	Proximity to coastal environment Available shelter																				
			Socioeconomic	Human desire to watch the event from an unsafe location Population age Population constitution Homeless Exposure to warnings/ alerts																				
Submersion of infrastructure	Disruption to infrastructure due to sea water rising above infrastructure	Harbour	Physical	Elevation of harbour infrastructure	None	None	Moderate	None	None	None	Minor	Minor	Minor	None	None	None	None	None	None	None	None	None	Major	0.68
			Environmental	-																				
			Socioeconomic	-																				
		Buildings	Physical	-	Moderate	None	Minor	None	None	None	Minor	None	None	Minor	None	Moderate	None	None	None	None	None	None	Minor	0.74
			Environmental	Proximity to coastline																				
			Socioeconomic	-																				
		Transport infrastructure	Physical	-	None	None	None	None	Negligible	None	Minor	None	None	None	None	None	None	None	Negligible	Moderate	None	None	None	0.37
			Environmental	Proximity to coastline																				
			Socioeconomic	-																				
Health and Safety risks	Drowning/ presence of submerged hazards leading to injury or death	People	Physical	-	None	Negligible	Minor	Minor	Major	None	Negligible	None	None	None	Minor	None	Negligible	None	None	None	Minor	None	Moderate	0.95
			Environmental	Proximity to urban environment																				
			Socioeconomic	Human desire to watch the event from an unsafe location Population age Population constitution Homeless Exposure to warnings/ alerts																				

Hazard Event:	**Coastal Erosion**
Frequency of Occurrence:	Very Frequent
Description of the Hazard Event: (Including relevant meteorological / climatological conditions and locations affected)	Damage to coastal environment due to coastal erosional processes. Loss of land, slow deterioration of coastal infrastructure.

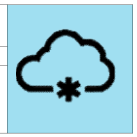
Hazard Impact	Impact Description:	Exposure	Vulnerability		Service Areas: Level of Disruption																			Impact Score
			Type	Description	Archives	Arts and Culture	Business and Economy	Community	Emergency Services	Environment	Finance	Governance and Administration	Built Heritage and Conservation	Housing	Human Resources	Information Technology	Leisure and Recreation	Libraries and Museums	Planning and Building	Roads and Transport	Tourism	Water Supply and Treatment	Coastal	
Damage to infrastructure	Erosional processes cause structural damage to infrastructure, compromising its integrity	LA Buildings	Physical	Use of material Built Heritage Presence of coastal defences	Minor	None	Minor	None	None	None	Minor	None	Minor	None	None	None	None	None	None	None	None	None	Minor	0.53
			Environmental	Proximity to coastline																				
			Socioeconomic	-																				
		Harbours	Physical	Presence of coastal defences	None	None	Moderate	None	Minor	None	Minor	None	Minor	None	None	None	Moderate	None	None	Moderate	Minor	None	Moderate	1.05
			Environmental	-																				
			Socioeconomic	-																				
		Housing	Physical	Use of material Built Heritage Presence of coastal defences	None	None	None	Minor	Minor	None	Minor	None	None	Minor	None	None	None	None	None	Moderate	None	None	None	0.58
			Environmental	Proximity to coastline																				
			Socioeconomic	-																				
		Roads	Physical	Presence of coastal defences	None	None	Minor	None	Minor	None	Minor	Negligible	None	None	None	None	None	None	None	Moderate	Minor	None	None	0.63
			Environmental	Proximity to coastline																				
			Socioeconomic	-																				
		Temporary structures (e.g., lifeguard huts/ temporary bridges)	Physical	Integrity of structure	None	None	Negligible	Negligible	None	None	Negligible	None	None	None	None	None	None	None	None	Negligible	None	None	Minor	0.32
			Environmental	Proximity to coastline																				
			Socioeconomic	-																				
		Coastal defences	Physical	Type of defence	None	None	None	None	None	None	Minor	None	None	None	None	None	None	None	Minor	None	None	None	Major	0.42
			Environmental	-																				
			Socioeconomic	-																				
		Commerce	Physical	Storage of stock/ equipment	Negligible	None	Minor	None	None	None	Negligible	None	None	None	None	Minor	None	None	None	None	Minor	None	Moderate	0.58
			Environmental	Proximity to sea																				
			Socioeconomic	Wexford Town is located at the mouth of the river Slaney and was very vulnerable to coastal flooding in the past																				
		Railway	Physical	Presence of coastal defences	None	None	Minor	None	None	None	Minor	None	None	None	None	None	None	None	None	Moderate	Negligible	None	Moderate	0.58
			Environmental	Proximity to coastline																				
			Socioeconomic	-																				
Damage to Amenities	Erosional processes deteriorate amenities located on the coast	Caravan Parks	Physical	Soil characteristics Presence of coastal defences	None	None	None	Minor	None	None	Minor	None	None	Minor	Negligible	None	Moderate	None	Negligible	None	None	None	None	0.58
			Environmental	Proximity to coastline																				
			Socioeconomic	-																				
		Tourist Amenity Areas	Physical	Presence of coastal defences	None	Minor	None	Minor	None	None	Minor	None	None	None	Negligible	None	Moderate	None	None	None	Moderate	None	Minor	0.79
			Environmental	Proximity to coastline																				
			Socioeconomic	-																				
		Walkways and trails	Physical	-	None	None	None	Minor	None	None	Negligible	None	None	None	None	None	Minor	None	None	None	Minor	None	None	0.37
			Environmental	Ground elevation and gradient relative to sea level Proximity to rivers																				
			Socioeconomic	-																				
		Access to bathing waters	Physical	Soil characteristics Presence of coastal defences	None	None	None	Minor	None	Negligible	Negligible	None	None	None	None	None	Moderate	None	None	None	Moderate	None	Minor	0.63
			Environmental	-																				
			Socioeconomic	-																				
Damage to built heritage	Erosional processes compromise built heritage	Ringforts	Physical	Presence of coastal defences	None	None	Negligible	Minor	None	None	Negligible	None	Major	None	None	None	Moderate	None	None	None	Moderate	None	None	0.74
			Environmental	Proximity to coastline																				
			Socioeconomic	-																				
Reduced land use	Erosional processes reduce the overall landmass	Agricultural land	Physical	Soil characteristics Presence of coastal defences	None	None	Minor	None	None	None	Negligible	None	None	None	None	None	None	None	Minor	None	None	None	None	0.26
			Environmental	Proximity to coastline																				
			Socioeconomic	Type of farming																				
Health and Safety Risks	Drowning/ presence of submerged hazards leading to injury or death	General public	Physical	-	None	None	Minor	None	Minor	None	Negligible	None	None	None	None	None	Negligible	None	None	None	Minor	None	Major	0.63
			Environmental	Proximity to coastal environment																				
			Socioeconomic	Human desire to watch the event from an unsafe location Population age Population constitution Exposure to warnings/ alerts																				
Damage to environment	Erosional processes destroy the environment and natural heritage	Dune habitat systems	Physical	Heritage Presence of coastal defences	None	None	None	None	None	Major	Negligible	None	None	None	None	None	None	None	Minor	None	None	None	Moderate	0.53
			Environmental	Proximity to coastline Time of year																				
			Socioeconomic	-																				
		Beaches	Physical	Soil characteristics Presence of coastal defences	None	None	Negligible	Minor	None	Moderate	Negligible	None	None	None	None	None	Moderate	None	Minor	None	Moderate	None	Moderate	0.95
			Environmental	Influenced by tidal conditions There are 21 erosion risk zones identified for Wexford's coastlines																				
			Socioeconomic	-																				
		SAC/SPA/natural habitats	Physical	Presence of coastal defences	None	None	None	None	None	Major	Negligible	None	None	None	None	None	None	None	Minor	None	None	None	Moderate	0.53
			Environmental	-																				
			Socioeconomic	-																				
		Soft cliffs and coastlines	Physical	Soil properties Presence of coastal defences	None	None	None	None	None	Moderate	Negligible	None	None	None	None	None	Moderate	None	Minor	None	Minor	None	Moderate	0.74
			Environmental	Influenced by tidal conditions There are 21 erosion risk zones identified for Wexford's coastlines																				
			Socioeconomic	-																				

Hazard Event:	**Coastal Flood**
Frequency of Occurrence:	Common
Description of the Hazard Event: (Including relevant meteorological / climatological conditions and locations affected)	High sea levels, pressures, and strong winds cause flooding along the coasts. Coastal areas particularly affected.

Hazard Impact	Impact Description:	Exposure	Vulnerability		Service Areas: Level of Disruption																			Impact Score
			Type	Description	Archives	Arts and Culture	Business and Economy	Community	Emergency Services	Environment	Finance	Governance and Administration	Built Heritage and Conservation	Housing	Human Resources	Information Technology	Leisure and Recreation	Libraries and Museums	Planning and Building	Roads and Transport	Tourism	Water Supply and Treatment	Coastal	
Damage to infrastructure	Flood water affecting built environment. Can lead to closure of facilities	LA buildings	Physical	Use of material Built Heritage Fixed or manual flood defences Flooded outfalls Structural loading	Moderate	None	Negligible	None	None	None	Minor	None	Negligible	None	Negligible	Moderate	None	None	Minor	None	None	None	Minor	0.79
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area Proximity to coastal environment																				
			Socioeconomic	Wexford Town is located at the mouth of the river Slaney and was very vulnerable to coastal flooding in the past																				
		Roads & Bridges	Physical	Use of material Built Heritage Structural loading	None	None	None	None	None	None	Negligible	None	Negligible	None	None	None	None	None	None	Minor	None	None	None	0.21
			Environmental	-																				
			Socioeconomic	Wexford Town is located at the mouth of the river Slaney and was very vulnerable to coastal flooding in the past																				
		Housing	Physical	Use of material Built Heritage Fixed or manual flood defences Flooded outfalls Structural loading	None	None	None	Negligible	None	None	Minor	None	None	Moderate	Negligible	None	None	None	None	None	None	None	None	None	0.37
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area Proximity to coastal environment																				
			Socioeconomic	Wexford Town is located at the mouth of the river Slaney and was very vulnerable to coastal flooding in the past																				
		Construction sites	Physical	Security of materials Silt netting	None	None	Minor	None	None	None	Negligible	None	None	None	None	None	None	None	Minor	None	None	None	None	0.26
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area Proximity to coastal environment																				
			Socioeconomic	Wexford Town is located at the mouth of the river Slaney and was very vulnerable to coastal flooding in the past																				
		Harbour	Physical	Presence of coastal defences	None	None	Moderate	Minor	None	None	Negligible	None	None	None	None	None	Minor	None	None	None	Moderate	None	Moderate	0.74
			Environmental	Impermeability of surface																				
			Socioeconomic	-																				
		Drainage networks	Physical	Capacity Build up of silt	None	None	None	None	None	Minor	Negligible	None	None	None	None	None	None	None	None	None	None	None	None	0.16
			Environmental	Proximity to coastline																				
			Socioeconomic	-																				
		Land use suitability	Physical	Adequacy of drainage network	None	None	None	None	None	None	Negligible	None	None	None	None	None	None	None	Minor	None	None	None	None	0.16
			Environmental	Proximity to coastline																				
			Socioeconomic	-																				
		Commerce	Physical	Storage of stock/ equipment	Negligible	None	Minor	None	None	None	Negligible	None	None	None	None	Minor	None	None	None	None	Minor	None	Moderate	0.58
			Environmental	Proximity to urban environment																				
			Socioeconomic	Wexford Town is located at the mouth of the river Slaney and was very vulnerable to coastal flooding in the past																				
		Monuments and Historic Towns	Physical	Use of material Built Heritage Structural loading	None	None	None	None	None	None	Minor	None	Moderate	None	None	None	None	None	Negligible	None	Minor	None	None	0.42
			Environmental	Ground elevation and gradient relative to surrounding area Proximity to coastal environment																				
			Socioeconomic	Wexford Town is located at the mouth of the river Slaney and was very vulnerable to coastal flooding in the past																				
Unuseable roads	Roads will become inundated with water and become inaccessable	Road network	Physical	Efficiency of drainage network Flooded outfalls	None	None	Negligible	Negligible	Moderate	None	Negligible	Negligible	None	None	None	None	Negligible	None	Negligible	Moderate	Negligible	None	None	0.68
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area Proximity to coastal environment																				
			Socioeconomic	-																				
		Pathways/ cycle lanes	Physical	Drainage network	None	None	None	Minor	None	None	Negligible	None	None	None	None	None	Minor	None	Negligible	Moderate	Negligible	None	None	0.53
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area Proximity to coastal environment																				
			Socioeconomic	-																				
		General public	Physical	-	None	None	None	None	None	None	Negligible	None	None	None	None	None	Negligible	None	Negligible	None	Minor	None	None	0.26
			Environmental	Road congestion																				
			Socioeconomic	Exposure to warnings/ alerts																				
		Emergency responders	Physical	-	None	None	Minor	None	Major	None	Negligible	None	None	None	None	None	None	None	None	None	None	None	None	0.37
			Environmental	Road congestion																				
			Socioeconomic	Reliance on TII for alerts on National roads Extended workload and overtime leading to burnout and availability of monitoring staff																				
Damage to environment	Loss of biodiversity	SAC/SPA/natural habitats	Physical	Presence of coastal defences	None	None	None	None	None	Major	Negligible	None	None	None	None	None	None	None	Minor	None	None	None	None	0.37
			Environmental	-																				
			Socioeconomic	-																				
		Beaches	Physical	Presence of coastal defences Soil characteristics Presence of coastal defences	None	None	Negligible	Minor	None	Moderate	Negligible	None	None	None	None	None	Moderate	None	None	None	Moderate	None	Moderate	0.84
			Environmental	Influenced by tidal conditions There are 21 erosion risk zones identified for Wexford's coastlines																				
			Socioeconomic	-																				
Damage to coastal amenities	Flooding deteriorates the amenities located on the coast	Walkways and trails	Physical	-	None	None	None	Minor	None	None	Negligible	None	None	None	None	None	Minor	None	None	None	Minor	None	None	0.37
			Environmental	Ground elevation and gradient relative to sea level Proximity to rivers																				
			Socioeconomic	-																				
		Access to bathing waters	Physical	Soil characteristics Presence of coastal defences	None	None	None	Minor	None	Negligible	Negligible	None	None	None	None	None	Moderate	None	None	None	Moderate	None	Minor	0.63
			Environmental	-																				
			Socioeconomic	-																				

Hazard Impact	Impact Description:	Exposure	Vulnerability		Service Areas: Level of Disruption																			
			Type	Description	Archives	Arts and Culture	Business and Economy	Community	Emergency Services	Environment	Finance	Governance and Administration	Built Heritage and Conservation	Housing	Human Resources	Information Technology	Leisure and Recreation	Libraries and Museums	Planning and Building	Roads and Transport	Tourism	Water Supply and Treatment	Coastal	Impact Score
Reduced water quality	Sea water, debris, or leachate from surface run off substances entering water systems. Boil water notices issued in some cases	Water bodies	Physical	Sewage overflow inputs into water bodies Water turbidity Combined foul and surface system	None	None	Negligible	None	None	Major	Negligible	None	None	None	None	None	None	None	None	None	None	Major	Minor	0.63
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area Proximity to coastal environment																				
			Socioeconomic	-																				
		Water supply distribution	Physical	-	None	None	Negligible	Negligible	None	None	Negligible	None	None	Negligible	Negligible	None	None	None	None	None	None	Major	None	0.47
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area Proximity to coastal environment																				
			Socioeconomic	Extended workload and overtime leading to burnout and availability of monitoring staff Resoonsibility (Irish Water)																				
Temporary housing	Relocation of homeless and residents of flooded properties	General public	Physical	-	None	None	None	None	None	None	Negligible	Negligible	None	Moderate	Minor	None	Negligible	None	None	None	Minor	None	None	0.53
			Environmental	Proximity to coastal environment																				
			Socioeconomic	Population age Population constitution Housing availability																				
		LA staff	Physical	-	None	None	None	None	None	None	Negligible	Negligible	None	Moderate	Minor	None	None	None	None	None	Negligible	None	None	0.42
			Environmental	Proximity to coastal environment																				
			Socioeconomic	Population age Population constitution Housing availability																				
		Homeless	Physical	-	None	None	None	None	None	None	Negligible	Negligible	None	Moderate	Minor	None	None	None	None	None	None	None	None	0.37
			Environmental	Proximity to coastal environment																				
			Socioeconomic	Population age Population constitution Housing availability																				
Health and Safety risks	Drowning/ presence of submerged hazards leading to injury or death	General public	Physical	-	None	None	Minor	None	Minor	None	Negligible	None	None	None	None	None	Negligible	None	None	None	Minor	None	Minor	0.53
			Environmental	Proximity to coastal environment																				
			Socioeconomic	Human desire to watch the event from an unsafe location Population age Population constitution Exposure to warnings/ alerts																				
		LA staff	Physical	-	None	None	Minor	None	Minor	None	Negligible	Negligible	None	None	None	None	None	None	Negligible	None	Negligible	None	Minor	0.53
			Environmental	Proximity to coastal environment																				
			Socioeconomic	Population age Population constitution																				
		Homeless	Physical	-	None	None	None	None	Minor	None	Negligible	None	None	None	None	None	None	None	None	None	None	None	None	0.16
			Environmental	Proximity to coastal environment																				
			Socioeconomic	Population age Population constitution																				
Cancellation/ postponing of cultural events	Adverse weather disrupting ability to hold a cultural event	Cultural events	Physical	-	None	Moderate	Negligible	None	None	None	Negligible	None	None	None	None	None	Negligible	None	None	None	Minor	None	Minor	0.53
			Environmental	Proximity to coastal environment																				
			Socioeconomic	-																				

Hazard Event:	**Heavy Snowfall**
Frequency of Occurrence:	Common
Description of the Hazard Event: (Including relevant meteorological / climatological conditions and locations affected)	Red warning: significant falls of snow likely to cause accumulations of 8cm or greater below 250m above mean sea level. Orange warning: significant falls of snow likely to cause accumulations of 3cm or greater below 250m above mean sea level. Yellow warning: scattered snow showers giving accumulations of less than 3cm below 250m above mean sea level.

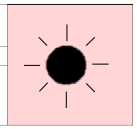


Hazard Impact	Impact Description:	Exposure	Vulnerability		Service Areas: Level of Disruption																			
			Type	Description	Archives	Arts and Culture	Business and Economy	Community	Emergency Services	Environment	Finance	Governance and Administration	Built Heritage and Conservation	Housing	Human Resources	Information Technology	Leisure and Recreation	Libraries and Museums	Planning and Building	Roads and Transport	Tourism	Water Supply and Treatment	Coastal	Impact Score
Damage to infrastructure	Heavy buildup of snow exceeding structural limits	LA Buildings	Physical	Use of material Built Heritage Structural loading Time to thaw	Minor	None	Minor	Minor	None	None	Minor	Negligible	Minor	None	None	None	None	Minor	Minor	None	Minor	None	Minor	1.00
			Environmental	Ground elevation relative to sea level																				
			Socioeconomic	-																				
		Housing	Physical	Use of material Built Heritage Structural loading Time to thaw	None	None	None	Minor	Minor	None	Minor	None	None	Minor	None	None	None	None	None	None	None	None	None	0.42
			Environmental	Ground elevation relative to sea level																				
			Socioeconomic	-																				
		Bridges	Physical	Use of material Built Heritage Structural loading Time to thaw	None	None	Negligible	None	Negligible	None	Negligible	None	Negligible	None	None	None	None	None	None	Moderate	None	None	None	0.37
			Environmental	Ground elevation relative to sea level																				
			Socioeconomic	-																				
		Power supply	Physical	Presence of overhead lines Time to thaw	Negligible	Negligible	Major	Negligible	Minor	Negligible	Negligible	Negligible	Negligible	Negligible	Minor	Moderate	Negligible	Negligible	Negligible	Moderate	Negligible	Moderate	Negligible	2.21
			Environmental	Ground elevation relative to sea level																				
			Socioeconomic	-																				
		Water and wastewater treatment plants	Physical	Use of material Built Heritage Structural loading Back up generator availability Time to thaw	None	None	Minor	None	Minor	None	Negligible	None	None	None	Minor	None	None	None	None	None	Negligible	Major	None	
			Environmental	Ground elevation relative to sea level																				
			Socioeconomic	-																				
		Telemetry	Physical	Structural loading Backup generators Time to thaw	Negligible	Negligible	Major	Negligible	Minor	Negligible	Minor	Negligible	Negligible	None	Minor	Moderate	Negligible	Negligible	None	Moderate	Negligible	Moderate	Negligible	1.53
			Environmental	Proximity to vegetation																				
			Socioeconomic	-																				
Damage to environment	Erosion due to freeze-thaw action	SAC/SPA/natural habitats	Physical	Cliff stability	None	None	None	None	None	Moderate	Negligible	None	None	None	None	None	Negligible	None	None	None	Negligible	None	Minor	0.42
			Environmental	Elevation relative to sea level																				
			Socioeconomic	-																				
Disruption to infrastructure/ facilities	Snow buildup disrupting transport networks, building access, amenity access, and water treatment processes	Transport infrastructure	Physical	Time to thaw	None	None	Moderate	Minor	Major	None	Negligible	None	None	None	Negligible	None	Minor	None	Negligible	Moderate	Moderate	None	None	1.05
			Environmental	Ground elevation relative to sea level																				
			Socioeconomic	Snow removing measures High impact for people who reside in isolated locations who are cut off with no access to services																				
		Buildings	Physical	Time to thaw	None	None	Minor	Minor	None	None	Negligible	Negligible	None	None	None	None	Negligible	Minor	Minor	None	Minor	None	Minor	0.79
			Environmental	Ground elevation relative to sea level																				
			Socioeconomic	-																				
		Harbour	Physical	Access to vessels at piers & harbours compromised/unsafe Time to thaw	None	None	Minor	None	None	None	Negligible	None	None	None	None	None	Minor	None	None	None	None	None	Major	0.47
			Environmental	-																				
			Socioeconomic	-																				
		Amenities	Physical	Time to thaw	None	None	None	Moderate	None	None	Negligible	None	None	None	Negligible	None	Minor	Moderate	None	None	Minor	None	None	0.63
			Environmental	Ground elevation relative to sea level																				
			Socioeconomic	Snow removing measures																				
		Water and wastewater treatment systems	Physical	Time to thaw	None	None	Negligible	None	Minor	None	Minor	None	None	None	Minor	None	None	None	None	None	None	Major	None	0.63
			Environmental	Ground elevation relative to sea level																				
			Socioeconomic	Snow removing measures																				
		Schools	Physical	Time to thaw	None	None	Minor	Moderate	None	None	Negligible	None	None	None	Negligible	None	None	None	None	None	None	None	None	0.37
			Environmental	Ground elevation relative to sea level																				
			Socioeconomic	Snow removing measures																				
Health and Safety risks	Heavy snowfall affects safe travel and poses a risk of injury	General public	Physical	-	None	Negligible	Minor	Minor	Minor	None	Negligible	None	None	None	None	None	None	None	Negligible	None	None	None	Moderate	0.63
			Environmental	Available cover Proximity to urban environments																				
			Socioeconomic	Population age Population constitution																				
		Council staff	Physical	-	None	None	Moderate	None	Moderate	None	Negligible	Negligible	None	None	None	None	None	Minor	Minor	None	None	None	Moderate	0.79
			Environmental	Available cover Proximity to urban environments																				
			Socioeconomic	Population age Population constitution Training required to operate vehicles/equipment to aid in emergency events																				
		Outdoor workers	Physical	Transport method used	None	None	Minor	Minor	Moderate	None	Negligible	None	None	None	None	None	None	None	None	None	None	None	Moderate	0.58
			Environmental	Available cover Proximity to urban environments																				
			Socioeconomic	Population age Population constitution Training required to operate vehicles/equipment to aid in emergency events																				
Minor flooding issues	Fast thawing of large amounts of snow can lead to excessive amounts of surface run off	Drainage network	Physical	Capacity fo drainage network	None	None	Negligible	None	None	None	Negligible	None	None	None	None	None	None	None	None	Minor	None	None	None	0.21
			Environmental	-																				
			Socioeconomic	-																				
Reduced air quality	Heavy snow leads to less active travel and the need for more heat in buildings, increasing burning of fossil fuels	Air	Physical	Level of insulation of buildings	None	None	None	None	None	Minor	Negligible	None	None	None	None	None	None	None	None	None	None	None	None	0.16
			Environmental	Proximity to urban environment																				
			Socioeconomic	-																				
		People	Physical	-	None	None	None	Negligible	Negligible	None	Negligible	None	None	None	Negligible	None	None	None	None	None	None	None	None	None	0.21
			Environmental	-																				
			Socioeconomic	Population age Population constitution																				
Frostbite	Exposure to snow can lead to frostbite	People	Physical	-	None	None	Minor	Minor	Moderate	None	Negligible	None	None	None	Minor	None	Minor	None	None	None	Minor	None	Minor	0.84
			Environmental	Proximity to urban environment Available cover																				
			Socioeconomic	Human desire to watch the event from an unsafe location Population age Population constitution Homeless																				

Hazard Event:	**Heatwave**
Frequency of Occurrence:	Common
Description of the Hazard Event: (Including relevant meteorological / climatological conditions and locations affected)	Record high temperatures with temperatures exceeding 30°C over a number of consecutive days. Urban areas particularly affected.

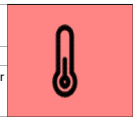
Hazard Impact	Impact Description:	Exposure	Vulnerability		Service Areas: Level of Disruption																			Impact Score
			Type	Description	Archives	Arts and Culture	Business and Economy	Community	Emergency Services	Environment	Finance	Governance and Administration	Built Heritage and Conservation	Housing	Human Resources	Information Technology	Leisure and Recreation	Libraries and Museums	Planning and Building	Roads and Transport	Tourism	Water Supply and Treatment	Coastal	
Hot and uncomfortable working conditions	High temperatures in homes and office causing discomfort	Outdoor workers	Physical	-	None	None	Moderate	None	None	None	Negligible	None	None	None	Moderate	None	None	None	None	None	None	Minor	Minor	0.58
			Environmental	Limited access to green areas/ areas of shade Inadequate access to water/ sun screen/ cooling apparatus																				
			Socioeconomic	Population age Population constitution																				
		Indoor workers	Physical	-	None	None	Moderate	None	None	None	Negligible	None	None	None	Moderate	None	None	None	None	None	None	Minor	Minor	0.58
			Environmental	Limited access to green areas/ areas of shade Inadequate access to water/ cooling apparatus																				
			Socioeconomic	Population age Population constitution																				
Risk of fires	Wildfires or domestic fires are easily started in heatwaves due to the dryness of the environment	People	Physical	Campfires going out of control BBQ's in urban areas gives of stray flame	None	None	None	None	Moderate	None	Negligible	None	None	None	None	None	Negligible	None	None	None	None	None	None	0.26
			Environmental	Proximity to fire Exposure to fire																				
			Socioeconomic	Population age Population constitution																				
		Environment	Physical	-	None	None	None	None	None	Moderate	Negligible	None	None	None	None	None	None	None	None	None	None	None	None	0.21
			Environmental	Proximity to fire upland areas, gorse areas, coastal areas (Sand dunes) typically affected																				
			Socioeconomic	-																				
Heat stroke	High heat can lead to heat stroke if careless	People	Physical	-	None	None	Negligible	Minor	Major	None	Negligible	None	None	None	Moderate	None	Negligible	None	None	None	Minor	Major	Minor	1.05
			Environmental	Limited access to green areas/ areas of shade Inadequate access to water and sun screen																				
			Socioeconomic	Population age Population constitution Homeless																				
Agricultural pressure	Issues with provision of water for animals, insufficient water for crops, and reduced grass	Farm animals	Physical	Status of water supply system Number of farm animals present	None	None	Minor	None	None	None	Negligible	None	None	None	None	None	None	None	None	None	None	None	None	0.16
			Environmental	Water source location																				
			Socioeconomic	Type of farm animals present																				
		Crops	Physical	Irrigation infrastructure	None	None	Minor	None	None	None	Negligible	None	None	None	None	None	None	None	None	None	None	None	None	0.16
			Environmental	-																				
			Socioeconomic	-																				
Pressure on recreational areas	High temperatures promotes the use of recreational facilities and puts pressure on existing infrastructure and lifeguard/ coastal/ emergency rescue services	Beaches/ Green areas	Physical	Access to recreational areas Capacity Beach services in place	None	None	Negligible	Minor	Moderate	Minor	Negligible	None	None	None	Minor	None	Moderate	None	None	Moderate	Moderate	Moderate	Moderate	1.37
			Environmental	Proximity to urban environment Water and waste services																				
			Socioeconomic	Resourcing of staff																				
Heat stress on buildings/ infrastructure	High temperatures resulting in structures being warped/ road surfaces being damaged	Roads and Bridges	Physical	Surface dressed roads susceptible to boiling of bitumen Built Heritage	None	None	None	None	None	None	Negligible	None	None	None	None	None	None	None	None	Moderate	None	None	None	0.21
			Environmental	Available shade cover Proximity to urban environment																				
			Socioeconomic	-																				
		LA Buildings	Physical	Material properties Built Heritage	None	None	None	None	None	None	Negligible	None	Minor	Minor	None	None	None	None	None	None	None	None	None	0.26
			Environmental	Available shade cover Proximity to urban environment																				
			Socioeconomic	-																				
		Housing	Physical	Material properties Built Heritage	None	None	None	None	None	None	Negligible	None	Minor	Minor	None	None	None	None	None	None	None	None	None	0.26
			Environmental	Available shade cover Proximity to urban environment																				
			Socioeconomic	-																				
		Pavements	Physical	Historical mixes of concrete prone to heaving	None	None	None	Minor	None	None	Negligible	None	None	None	None	None	Minor	None	None	Minor	None	None	None	0.37
			Environmental	Located within areas of high solar radiation																				
			Socioeconomic	-																				
Damage to monuments	Drying out of soil can destabilise monuments	Built heritage	Physical	Use of material Built heritage	None	None	None	None	None	None	Negligible	None	Minor	None	None	None	None	None	None	None	Negligible	None	None	0.21
			Environmental	Located within areas of high solar radiation																				
			Socioeconomic	-																				
Reduced water quality and supply	Water supplies drawing from water with high levels of dissolved material due to evaporation of water sources and water supply plants	Water bodies	Physical	Capacity Concentration of dissolved material	None	None	None	None	None	Moderate	Negligible	None	None	None	Minor	None	Moderate	None	None	None	Moderate	Major	None	0.84
			Environmental	Presence of shade Located within areas of high solar radiation																				
			Socioeconomic	-																				
		Water supply plants	Physical	Backup water supply	None	None	Moderate	None	Major	None	Negligible	None	None	None	None	None	Moderate	None	None	None	Moderate	Major	None	0.95
			Environmental	Presence of shade Located within areas of high solar radiation																				
			Socioeconomic	Plant upgrades in 2023																				
Damaged water treatment plants	Flows to treatment plants experiencing large amounts of organic loading due to evaporation, disrupting the treatment plant	Wastewater treatment plants	Physical	Capacity Concentration of dissolved material Combined foul and surface system	None	None	None	None	None	None	Negligible	None	None	None	None	None	None	None	None	None	None	Major	None	0.26
			Environmental	Proximity to urban environment Water and waste services																				
			Socioeconomic	-																				
Damage to environment	High temperatures can cause vegetation to dry up and die	SAC/SPA/natural habitats	Physical	Vegetation sensitivty to heat	None	None	None	None	None	Moderate	Negligible	None	None	None	None	None	None	None	None	None	None	None	Minor	0.32
			Environmental	Influenced by time of year Proximity to water bodies																				
			Socioeconomic	-																				

Hazard Event:	**Drought**
Frequency of Occurrence:	Common
Description of the Hazard Event: (including relevant meteorological / climatological conditions and locations affected)	Restrictions on water use. Low rainfall during periods of high temperatures or freezing of water sources/ distribution. There is evidence of a decreasing trend in summer rainfall.



Hazard Impact	Impact Description:	Exposure	Vulnerability		Service Areas: Level of Disruption																		
			Type	Description	Archives	Arts and Culture	Business and Economy	Community	Emergency Services	Environment	Finance	Governance and Administration	Built Heritage and Conservation	Housing	Human Resources	Information Technology	Leisure and Recreation	Libraries and Museums	Planning and Building	Roads and Transport	Tourism	Water Supply and Treatment	Coastal	Impact Score
Hot and uncomfortable working conditions	High temperatures in homes and office causing discomfort	Outdoor workers	Physical	-	None	None	Moderate	None	None	None	Negligible	None	None	None	Moderate	None	None	None	None	None	None	Minor	Minor	0.58
			Environmental	Limited access to green areas/ areas of shade Inadequate access to water/ sun screen/ cooling apparatus																			
			Socioeconomic	Population age Population constitution																			
		Indoor workers	Physical	-	None	None	Moderate	None	None	None	Negligible	None	None	None	Moderate	None	None	None	None	None	None	Minor	Minor	0.58
			Environmental	Limited access to green areas/ areas of shade Inadequate access to water/ cooling apparatus																			
			Socioeconomic	Population age Population constitution																			
Pressure on recreational areas	High temperatures promotes the use of recreational facilities and puts pressure on existing infrastructure	Beaches/ Green areas	Physical	Access to recreational areas Capacity Beach services in place	None	None	Negligible	Minor	Minor	Minor	Negligible	None	None	None	None	None	Major	None	None	Minor	Major	Moderate	Moderate	1.26
			Environmental	Proximity to urban environment Water and waste services																			
			Socioeconomic	-																			
Agricultural pressure	Issues with provision of water for animals, insufficient water for crops, and reduced grass	Farm animals	Physical	Status of water supply system Number of farm animals present	None	None	Minor	None	None	None	Negligible	None	None	None	None	None	None	None	None	None	None	None	None	0.16
			Environmental	Water source location																			
			Socioeconomic	Type of farm animals present																			
		Crops	Physical	Irrigation infrastructure	None	None	Minor	None	None	None	Negligible	None	None	None	None	None	None	None	None	None	None	None	None	0.16
			Environmental	-																			
			Socioeconomic	-																			
Heat stress on buildings/ infrastructure	High temperatures resulting in structures being warped/ road surfaces being damaged	Transport infrastructure	Physical	Material properties Built Heritage	None	None	None	None	None	None	Negligible	None	None	None	None	None	None	None	None	Moderate	None	None	None	0.21
			Environmental	Available shade cover Proximity to urban environment																			
			Socioeconomic	-																			
		Buildings	Physical	Material properties Built Heritage	None	None	None	None	None	None	Negligible	None	Minor	Minor	None	None	None	None	None	None	None	None	None	0.26
			Environmental	Available shade cover Proximity to urban environment																			
			Socioeconomic	-																			
Reduced water quality and supply	Water supplies drawing from water with high levels of dissolved material due to evaporation of water sources and water supply plants	Water bodies	Physical	Capacity Concentration of dissolved material Availability of groundwater	None	None	None	None	None	Moderate	Negligible	None	None	None	Minor	None	Moderate	None	None	None	Moderate	Major	None	0.84
			Environmental	Presence of shade Located within areas of high solar radiation																			
			Socioeconomic	-																			
		Water supply plants	Physical	Backup water supply Odour issues First flush due to rainfall after drought	None	None	Moderate	None	Major	None	Negligible	None	None	None	None	None	Moderate	None	None	None	Moderate	Major	Minor	1.05
			Environmental	Presence of shade Located within areas of high solar radiation																			
			Socioeconomic	Plant upgrades in 2023																			
Damaged water treatment plants	Flows to treatment plants experiencing large amounts of organic loading due to evaporation, disrupting the treatment plant	Wastewater treatment plants	Physical	Capacity Concentration of dissolved material Combined foul and surface system First flush due to rainfall after drought	None	None	None	None	None	None	Negligible	None	None	None	None	None	None	None	None	None	None	Major	None	0.26
			Environmental	Proximity to urban environment Water and waste services																			
			Socioeconomic	-																			
Damage to environment	High temperatures can cause vegetation to dry up and die	SAC/SPA/natural habitats	Physical	Vegetation sensitivity to heat Lowered water levels	None	None	None	None	None	Moderate	Negligible	None	None	None	None	None	None	None	None	None	None	None	Minor	0.32
			Environmental	Influenced by time of year Proximity to water bodies																			
			Socioeconomic	-																			

Hazard Event:	**Above Average Surface Temperature**
Frequency of Occurrence:	Common
Description of the Hazard Event: (Including relevant meteorological / climatological conditions and locations affected)	Prolonged periods of higher than average temperatures. Observations indicate an increase in the surface temperature for Ireland of 0.9°C over the last 120 years. Urban areas particularly affected.



Hazard Impact	Impact Description:	Exposure	Vulnerability		Service Areas: Level of Disruption																			Impact Score
			Type	Description	Archives	Arts and Culture	Business and Economy	Community	Emergency Services	Environment	Finance	Governance and Administration	Built Heritage and Conservation	Housing	Human Resources	Information Technology	Leisure and Recreation	Libraries and Museums	Planning and Building	Roads and Transport	Tourism	Water Supply and Treatment	Coastal	
Change in biodiversity	Changes in surface temperatures leads to a promotion in growth of invasive species to the detriment to native species	Invasive species	Physical	Growing conditions required of the invasive flora	None	None	None	None	None	Moderate	Negligible	None	None	None	None	None	None	None	Negligible	None	None	None	Minor	0.37
			Environmental	Influenced by time of year																				
			Socioeconomic	Invasive Alien Plant Species protocols in place to reduce the spread of invasive species																				
		Native species	Physical	Growing conditions required of the native flora	None	None	None	None	None	Moderate	Negligible	None	None	None	None	None	None	None	Negligible	None	None	None	Minor	0.37
			Environmental	Influenced by time of year																				
			Socioeconomic	-																				
Change in phenology	Changes in surface temperatures leads to a disruption to the phenology cycle, affecting pollinators and seasonal interactions	Pollinators	Physical	Sensitivity of pollinaters to changes in temperatures	None	None	None	None	None	Moderate	Negligible	None	None	None	None	None	None	None	None	None	None	None	None	0.21
			Environmental																					
			Socioeconomic	-																				
Hot and uncomfortable working conditions	High temperatures in homes and office causing discomfort	Dwellings	Physical	Inadequate cooling mechanisms	None	None	None	Minor	None	None	Negligible	None	None	Minor	None	None	None	None	None	None	None	None	Minor	Minor	0.47
			Environmental	Proximity to high density urban areas																				
			Socioeconomic	-																				
		Outdoor workers	Physical	-	None	None	Moderate	None	None	None	Negligible	None	None	None	Moderate	None	None	None	None	None	None	None	Minor	Minor	0.58
			Environmental	Limited access to green areas/ areas of shade Inadequate access to water/ sun screen/ cooling apparatus																				
			Socioeconomic	Population age Population constitution																				
		Indoor workers	Physical	-	None	None	Moderate	None	None	None	Negligible	None	None	None	Moderate	None	None	None	None	None	None	None	Minor	Minor	0.58
			Environmental	Limited access to green areas/ areas of shade Inadequate access to water/ cooling apparatus																				
			Socioeconomic	Population age Population constitution																				
Agricultural pressure	Issues with provision of water for animals, insufficient water for crops, and reduced grass	Farm animals	Physical	Status of water supply system Number of farm animals present	None	None	Minor	None	None	None	Negligible	None	None	None	None	None	None	None	None	None	None	None	None	0.16
			Environmental	Water source location																				
			Socioeconomic	Type of farm animals present																				
		Crops	Physical	Irrigation infrastructure	None	None	Minor	None	None	None	Negligible	None	None	None	None	None	None	None	None	None	None	None	None	0.16
			Environmental	-																				
			Socioeconomic	-																				
Pressure on recreational areas	High temperatures promotes the use of recreational facilities and puts pressure on existing infrastructure	Beaches/ Green areas	Physical	Access to recreational areas Capacity Beach services in place	None	None	Negligible	Minor	Minor	Minor	Negligible	None	None	None	None	None	Moderate	None	None	Minor	Moderate	Moderate	Moderate	1.16
			Environmental	Proximity to urban environment Water and waste services																				
			Socioeconomic	-																				
Heat stress on buildings/ infrastructure	High temperatures resulting in structures being warped/ road surfaces being damaged	Transport infrastructure	Physical	Material properties Built Heritage	None	None	None	None	None	None	Negligible	None	None	None	None	None	None	None	None	Moderate	None	None	None	0.21
			Environmental	Available shade cover Proximity to urban environment																				
			Socioeconomic	-																				
		Buildings	Physical	Material properties Built Heritage	None	None	None	None	None	None	Negligible	None	Minor	Minor	None	None	None	None	None	None	None	None	None	0.26
			Environmental	Available shade cover Proximity to urban environment																				
			Socioeconomic	-																				
Reduced water quality and supply	Water supplies drawing from water with high levels of dissolved material due to evaporation of water sources and water supply plants	Water bodies	Physical	Capacity Concentration of dissolved material	None	None	None	None	None	Moderate	Negligible	None	None	None	Minor	None	Moderate	None	None	None	Moderate	Moderate	None	0.79
			Environmental	Presence of shade Located within areas of high solar radiation																				
			Socioeconomic	-																				
		Water supply plants	Physical	Backup water supply	None	None	Moderate	None	None	None	Negligible	None	None	None	None	None	Moderate	None	None	None	Moderate	Moderate	None	0.68
			Environmental	Presence of shade Located within areas of high solar radiation																				
			Socioeconomic	Responsibility (Irish Water)																				
Damaged water treatment plants	Flows to treatment plants experiencing large amounts of organic loading due to evaporation, disrupting the treatment plant	Wastewater treatment plants	Physical	Capacity Concentration of dissolved material Combined foul and surface system	None	None	None	None	None	None	Negligible	None	None	None	None	None	None	None	None	None	None	Moderate	None	0.21
			Environmental	Proximity to urban environment Water and waste services																				
			Socioeconomic	-																				
Damage to environment	High temperatures can cause vegetation to dry up and die	SAC/SPA/natural habitats	Physical	Vegetation sensitivty to heat	None	None	None	None	None	Moderate	Negligible	None	None	None	None	None	None	None	None	None	None	None	Minor	0.32
			Environmental	Influenced by time of year Proximity to water bodies																				
			Socioeconomic	-																				

Hazard Event:	**Increase in Relative Sea Level**
Frequency of Occurrence:	Occasional
Description of the Hazard Event: (Including relevant meteorological / climatological conditions and locations affected)	Low lying regions are submerged. Water vessels are displaced onto land. Surfaces directly exposed to harsh sea water. Satellite observations indicate that sea level around Ireland has risen by approximately 2-3mm per year since the early 1990s.

Hazard Impact	Impact Description:	Exposure	Vulnerability		Service Areas: Level of Disruption																			
			Type	Description	Archives	Arts and Culture	Business and Economy	Community	Emergency Services	Environment	Finance	Governance and Administration	Built Heritage and Conservation	Housing	Human Resources	Information Technology	Leisure and Recreation	Libraries and Museums	Planning and Building	Roads and Transport	Tourism	Water Supply and Treatment	Coastal	Impact Score
Damage to environment	Erosion due to direct exposure to seawater	Coastlines/beaches	Physical	Soil composition	None	None	None	Minor	None	Minor	Negligible	None	None	None	None	None	Moderate	None	Minor	None	Moderate	None	Moderate	0.84
			Environmental	-																				
			Socioeconomic	Trade off between keeping coastlines and beaches or replace with coastal defences																				
		SAC/SPA/natural habitats	Physical	Soil composition	None	None	None	None	None	Moderate	Negligible	None	None	None	None	None	None	None	Minor	None	Negligible	None	Negligible	0.42
			Environmental	Proximity to coastline																				
			Socioeconomic	-																				
Early retirement of coastal defence works	Rising sea levels/ overtopping may leave certain flood defence works ineffective	Coastal areas	Physical	Type of coastal defences in place - capacity for adaptation	None	None	Minor	Minor	None	Minor	Negligible	None	Minor	None	None	None	None	None	Minor	Minor	None	None	Moderate	0.84
			Environmental	Influenced by tidal conditions																				
			Socioeconomic	Trade off between keeping coastlines and beaches or replace with coastal defences																				
Reduced water quality	Salt water entering water systems	Water bodies	Physical	Low volume water bodies Aquifer capacity	None	None	Minor	Negligible	None	None	Negligible	None	None	None	None	None	None	None	None	None	None	Major	None	0.42
			Environmental	Proximity to coastline																				
			Socioeconomic	-																				
		Water supply plants	Physical	Capacity to treat water with high salinity	None	None	Minor	Negligible	None	None	Negligible	None	None	None	None	None	None	None	None	None	None	Major	None	0.42
			Environmental	Proximity to coastline																				
			Socioeconomic	-																				
Submersion of infrastructure	Disruption to infrastructure due to sea water rising above infrastructure	Harbour	Physical	Piers and harbours not capable of providing safe launching and berthing	None	None	Moderate	None	None	None	Minor	Minor	None	None	None	None	None	None	None	None	None	None	Major	0.58
			Environmental	-																				
			Socioeconomic	Enhancement in the design of coastal defences required to include for Sea Level Rise which is significantly increasing the cost of projects																				
		LA Buildings	Physical	-	Moderate	None	Minor	None	None	None	Minor	None	Minor	None	None	Moderate	None	None	Negligible	None	None	None	None	0.68
			Environmental	Proximity to coastline																				
			Socioeconomic	Enhancement in the design of coastal defences required to include for Sea Level Rise which is significantly increasing the cost of projects																				
		Housing	Physical	-	None	None	None	Moderate	Minor	None	Minor	None	Minor	Moderate	None	None	None	None	None	None	None	None	None	None	0.63
			Environmental	Proximity to coastline																				
			Socioeconomic	Enhancement in the design of coastal defences required to include for Sea Level Rise which is significantly increasing the cost of projects																				
		Transport infrastructure	Physical	-	None	None	None	None	Minor	None	Minor	None	None	None	None	None	None	None	Negligible	Moderate	None	None	None	0.42
			Environmental	Proximity to coastline																				
			Socioeconomic	Enhancement in the design of coastal defences required to include for Sea Level Rise which is significantly increasing the cost of projects																				

Hazard Event:	**Above Average Precipitation**
Frequency of Occurrence:	Common
Description of the Hazard Event: (Including relevant meteorological / climatological conditions and locations affected)	Prolonged periods of rainfall. Change in pattern of typical rainfall periods.

Hazard Impact	Impact Description:	Exposure	Vulnerability		Service Areas: Level of Disruption																		Impact Score
			Type	Description	Archives	Arts and Culture	Business and Economy	Community	Emergency Services	Environment	Finance	Governance and Administration	Built Heritage and Conservation	Housing	Human Resources	Information Technology	Leisure and Recreation	Libraries and Museums	Planning and Building	Roads and Transport	Tourism	Water Supply and Treatment	Coastal	
Reduced water quality	Vegetation debris or leachates from surface run off entering water systems	Water bodies	Physical	Sewage overflow inputs into water bodies Gradient of ground Water turbidity Capacity	None	None	None	Minor	None	Minor	Negligible	None	None	None	None	None	None	None	None	None	None	Moderate	None	0.42
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area Proximity to urban environment																			
			Socioeconomic	-																			
		Water supply distribution	Physical	-	None	None	None	Minor	None	None	Negligible	None	None	None	None	None	None	None	None	None	None	Moderate	None	0.32
			Environmental	Impermeability of surface Ground elevation and gradient relative to surrounding area Proximity to urban environment																			
			Socioeconomic	Extended workload and overtime leading to burnout and availability of monitoring staff Resoonsibility (Irish Water)																			
Land erosion	Rainfall causing ground saturation, weakening ground strength	Land/cliffsides	Physical	Soil properties	None	None	None	None	Moderate	Moderate	Negligible	None	None	None	None	None	None	None	Minor	None	None	None	Minor	0.58
			Environmental	Ground elevation and gradient relative to surrounding area Proximity to urban environment																			
			Socioeconomic	-																			
More time spent indoors	Increased rainfall dissuading people to be outdoors	Mental health	Physical	-	None	None	Minor	Moderate	None	None	Negligible	None	None	None	Moderate	None	None	None	None	None	None	None	Minor	0.58
			Environmental	Proximity to facilities																			
			Socioeconomic	Population age Population constitution Home dynamics - living alone or with family																			
		Commerce	Physical	-	None	None	Moderate	None	None	None	Negligible	None	None	None	None	Minor	Moderate	None	None	None	Moderate	None	None	0.63
			Environmental	Ground elevation and gradient relative to surrounding area Proximity to urban environment																			
			Socioeconomic	-																			
Erosion of structures	Chemical reaction dissolving structures/ scour	LA buildings	Physical	Use of material Built Heritage	None	None	None	None	None	None	Negligible	None	Minor	None	None	None	None	None	None	None	None	None	None	0.16
			Environmental	-																			
			Socioeconomic	-																			
		Road network	Physical	Use of material Built Heritage	None	None	None	None	None	None	Negligible	None	None	None	None	None	None	None	None	Negligible	None	None	None	0.11
			Environmental	-																			
			Socioeconomic	-																			
		Housing	Physical	Use of material Built Heritage	None	None	None	None	None	None	Negligible	None	None	Negligible	None	None	None	None	None	None	None	None	None	0.11
			Environmental	-																			
			Socioeconomic	-																			

Hazard Event:	**Cold Spell**
Frequency of Occurrence:	Common
Description of the Hazard Event: (Including relevant meteorological / climatological conditions and locations affected)	Record low temperatures with temperatures between 0 and -10 degrees C throughout Winter.

Hazard Impact	Impact Description:	Exposure	Vulnerability: Type	Vulnerability: Description	Service Areas: Level of Disruption: Archives	Arts and Culture	Business and Economy	Community	Emergency Services	Environment	Finance	Governance and Administration	Built Heritage and Conservation	Housing	Human Resources	Information Technology	Leisure and Recreation	Libraries and Museums	Planning and Building	Roads and Transport	Tourism	Water Supply and Treatment	Coastal	Impact Score
Cold and uncomfortable working conditions	Low temperatures in homes and office causing discomfort	Outdoor workers	Physical	-	None	None	Moderate	None	None	None	Negligible	None	None	None	Moderate	None	None	None	None	None	None	Minor	Minor	0.58
			Environmental	Limited access to heating apparatus/ shelter																				
			Socioeconomic	Population age Population constitution																				
		Indoor workers	Physical	-	None	None	Moderate	None	None	None	Negligible	None	None	None	Moderate	None	None	None	None	None	None	Minor	Minor	0.58
			Environmental	Limited access to heating apparatus																				
			Socioeconomic	Population age Population constitution																				
Frostbite	Low temperatures can lead to frostbite if careless	People	Physical	-	None	None	Negligible	Minor	Major	None	Negligible	None	None	None	Moderate	None	None	None	None	None	None	Major	None	0.79
			Environmental	Proximity to urban environment																				
			Socioeconomic	Population age Population constitution Homeless																				
Cold stress on buildings/ infrastructure	Low temperatures resulting in structures being warped/ road surfaces being damaged	Tranpsort infrastructure	Physical	Material properties Built Heritage Changes in rates of deterioration - faster rate of deterioration in areas subject to sustained low temperatures	None	None	None	None	None	None	Negligible	None	None	None	None	None	None	None	None	Moderate	None	None	None	0.21
			Environmental	Proximity to urban environment																				
			Socioeconomic	-																				
		LA Buildings	Physical	Material properties Built Heritage	None	None	Minor	None	None	None	Negligible	None	Minor	Minor	None	None	None	None	None	None	None	None	None	0.37
			Environmental	Proximity to urban environment																				
			Socioeconomic	-																				
		Harbour	Physical	Access to vessels at piers & harbours compromised/unsafe	None	None	None	None	None	None	Negligible	None	None	None	None	None	None	None	None	None	None	None	Minor	0.16
			Environmental	-																				
			Socioeconomic	-																				
		Housing	Physical	Material properties Built Heritage	None	None	None	None	Minor	None	Negligible	None	Minor	Minor	None	None	None	None	None	None	None	None	None	0.37
			Environmental	Proximity to urban environment																				
			Socioeconomic	Requirement for additional heat and additional insulation of housing stock																				
Reduced water quality and supply	Frozen water restrict extraction and distribution of water	Water bodies	Physical	Depth of water	None	None	None	None	None	Major	Negligible	None	None	None	Minor	None	Moderate	None	None	None	Moderate	Major	Minor	1.00
			Environmental	Elevation in relation to sea level																				
			Socioeconomic	-																				
		Water supply infrastructure	Physical	Backup water supply Air volume in pipes	None	None	Moderate	None	Major	None	Negligible	None	None	None	None	None	Moderate	None	None	None	Moderate	Major	None	0.95
			Environmental	Elevation in relation to sea level																				
			Socioeconomic	-																				
Damaged water supply and treatment plants	Frozen water damaging treatment systems	Water and wastewater treatment plants	Physical	Air volume in pipes Combined foul and surface system	None	None	None	None	None	None	Negligible	None	None	None	None	None	None	None	None	None	None	Major	None	0.26
			Environmental	Elevation in relation to sea level																				
			Socioeconomic	-																				
Change in phenology	Changes in surface temperatures leads to a disruption to the phenology cycle	River habitats	Physical	Low temperatures bring about changes in species distribution and phenology of river systems	None	None	None	None	None	Moderate	None	None	None	None	None	None	None	None	None	None	None	None	None	0.16
			Environmental																					
			Socioeconomic	-																				
More time spent indoors	Cold temperatures dissuades people from going outdoors	Mental health	Physical	-	None	None	Minor	Moderate	None	None	Negligible	None	None	None	Moderate	None	None	None	None	None	None	None	Minor	0.58
			Environmental	Proximity to facilities																				
			Socioeconomic	Population age Population constitution Home dynamics - living alone or with family																				
Reduced air quality	Low temperatures lead to less active travel and the need for more heat in buildings, increasing burning of fossil fuels	Air	Physical	Level of insulation of buildings	None	None	None	None	None	Minor	Negligible	None	None	None	None	None	None	None	None	None	None	None	None	0.16
			Environmental	Proximity to urban environment																				
			Socioeconomic	-																				
		People	Physical	-	None	None	None	Negligible	Negligible	None	Negligible	None	None	None	Negligible	None	None	None	None	None	None	None	None	None	0.21
			Environmental	-																				
			Socioeconomic	Population age Population constitution Homeless																				
Damage to environment	Low temperatures can cause vegetation to freeze and die	SAC/SPA/natural habitats	Physical	Vegetation sensitivity to cold	None	None	None	None	None	Moderate	Negligible	None	None	None	None	None	None	None	None	None	None	None	None	0.21
			Environmental	Prolonged road salting affecting salinity of surrounding ground Influenced by time of year																				
			Socioeconomic	-																				
		Agricultural land	Physical	-	None	None	Negligible	Minor	Minor	Minor	Negligible	None	None	None	None	None	Major	None	None	Minor	Major	Moderate	Moderate	1.26
			Environmental	Prolonged road salting affecting salinity of surrounding ground Influenced by time of year																				
			Socioeconomic	-																				

Appendix E Current Impact Summary Matrix

CURRENT IMPACTS

Hazard Type		Current Frequency	Current Frequency (Score)	Asset Damage	Health and Wellbeing	Environment	Social	Financial	Reputation	Cultural Heritage	Current Impact
	River flood	Common	3	Major	Major	Moderate	Moderate	Moderate	Moderate	Moderate	3.29
	Coastal flood	Common	3	Major	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	3.14
	Coastal erosion	Very Frequent	5	Major	Moderate	Major	Minor	Moderate	Minor	Moderate	3.00
	Extreme precipitation	Frequent	4	Moderate	Moderate	Minor	Minor	Minor	Moderate	Moderate	2.57
	Drought	Common	3	Moderate	Moderate	Moderate	Moderate	Minor	Minor	Minor	2.57
	Severe windstorm	Very frequent	5	Moderate	Moderate	Moderate	Minor	Minor	Negligible	Moderate	2.43
	Heatwave	Common	3	Moderate	Moderate	Moderate	Minor	Negligible	Minor	Moderate	2.43
	Storm Surge	Common	3	Moderate	Moderate	Moderate	Minor	Minor	Negligible	Minor	2.29
	Pluvial flood	Common	3	Moderate	Minor	Minor	Minor	Minor	Minor	Minor	2.14
	Above average precipitation	Common	3	Moderate	Minor	Minor	Minor	Negligible	Negligible	Moderate	2.00
	Above average surface temperature	Common	3	Negligible	Minor	Major	Minor	Negligible	Negligible	Moderate	2.00
	Cold spell	Common	3	Moderate	Minor	Negligible	Minor	Minor	Negligible	Minor	1.86
	Heavy snowfall	Common	3	Minor	Minor	Minor	Negligible	Minor	Negligible	Minor	1.71
	Increase in Relative Sea Level	Occasional	2	Negligible	Negligible	Minor	Negligible	Negligible	Negligible	Minor	1.29

Appendix F Assessment of Future Climate Hazards and Impacts

Assessment of Future Climate Hazards

Hazard No.	Hazard Type		Current Frequency	Projected Frequency	Evidence Base
1		River flood	Common	Frequent	An analysis of river flows over a period of more than 50 years of data (1972-2017) indicates an increase in river flows across most of the country (Status of Ireland's Climate, EPA) and an increase in the projected frequency of very wet days (>30mm of precipitation) which will likely increase the frequency of flood events (www.climateireland.ie).
2		Pluvial flood	Common	Frequent	When compared with an annual average rainfall of 1186mm for the period 1961-1990, the thirty year period 1990-2019 shows a 70mm or almost 7% increase in rainfall (Status of Ireland's Climate, EPA) and an increase in the projected frequency of very wet days (>30mm of precipitation). Projections of precipitation indicate that precipitation is expected to become more variable with increases in dry periods in the summer and heavy precipitation in winter (www.climateireland.ie).
3		Above average precipitation	Common	Frequent	When compared with an annual average rainfall of 1186mm in the period 1961-1990, the thirty year period 1990-2019 shows a 70mm or almost 7% increase in rainfall. The last decade from 2006 - 2015 has been the wettest period in the period 1711- 2016 and there is evidence of an increasing trend in winter rainfall and a decreasing trend in summer rainfall (Status of Ireland's Climate, EPA).
4		Extreme precipitation	Frequent	Very Frequent	There is an increase in the projected frequency of very wet days (>30mm of precipitation) (Status of Ireland's Climate, EPA) and observed increases in the levels of winter rainfall but a decrease in summer rainfall (www.climateireland.ie).
5		Severe windstorm	Very frequent	Very Frequent	No long-term trend in wind speed can be determined with confidence based on the limited analysis carried out to date. Climate projections (www.climateireland.ie) indicate an decrease in the number of less intense storms but an increase in the storms which are rare events. Due to a limited number of studies, these projections should be considered with a high level of caution (A Multi-model ensemble approach, EPA).
6		Storm Surge	Common	Frequent	Expected surge levels for events of a 20 to 30 year return period are likely to increase by up to 9cm by 2100 (The Impact of Climate Change on Storm Surge over Irish Waters). Increasing wave heights have been observed over the last 70 years in the North Atlantic with typical winter season trends of increases up to 20 cm per decade, along with a northward displacement of storm tracks (Status of Ireland's Climate, EPA). There is however a projected decrease in the amount of smaller storms but an increase in the amount of extreme storms (www.climateireland.ie).
7		Coastal erosion	Very Frequent	Very Frequent	Climate projections (www.climateireland.ie) indicate a decrease in mean and extreme wave heights but an increase in the magnitude and intensity of storm wave heights which will likely increase the frequency of coastal erosion. There is also indication that the ocean acidity will likely increase. In addition, satellite observations indicate that sea levels around Ireland have increased by approximately 2-3 mm per year since the 1990s (The Status of Ireland's Climate, EPA), leading to increased levels of coastal erosion.
8		Coastal flood	Common	Frequent	Climate projections (www.climateireland.ie) indicate an increase in sea levels and an increase in the magnitude and intensity of storm wave weights which will likely lead to more coastal flood events. In addition, satellite observations indicate that sea levels around Ireland have increased by approximately 2-3 mm per year since the 1990s (The Status of Ireland's Climate, EPA), leading to increased levels of coastal flooding.
9		Increase in Relative Sea Level	Occasional	Common	Satellite observations indicate that sea levels around Ireland have increased by approximately 2-3 mm per year since the 1990s (The Status of Ireland's Climate, EPA).
10		Heatwave	Common	Frequent	Climate projections (www.climateireland.ie) indicate an increase in the average surface air temperatures across all seasons which will likely increase the intensity and frequency of heatwaves. There has been an increase in the number of warm days (temperature > 20°C). This is in line with trends evident for the rest of Western Europe (Status of Ireland's Climate, EPA).
11		Drought	Common	Frequent	Climate projections (www.climateireland.ie) indicate an increase in the average surface temperature as well as a decrease in the levels of summer rainfall (Status of Ireland's Climate, EPA) which will likely increase the intensity and frequency of droughts in the summer. An analysis on river flows over a period from 1992-2017 suggests an increase in drought conditions in the summer, particularly in the east of the country (Status of Ireland's Climate, EPA).
12		Above average surface temperature	Common	Frequent	Climate projections (www.climateireland.ie) indicate an increase in the average surface air temperatures across all seasons which will likely increase the intensity and frequency of heatwaves. There has been an increase in the number of warm days (temperature > 20°C). This is in line with trends evident for the rest of Western Europe (Status of Ireland's Climate, EPA).
13		Cold spell	Common	Occasional	There has been a decrease in the number of frost days (temperatures below 0°C) and a shortening of the frost season duration (www.climateireland.ie).
14		Heavy snowfall	Common	Occasional	Snowfall is projected to decrease substantially by the middle of the century (Nolan and Flanagan), but not to the extent where the frequency is considered rare.

Assessment of Future Climate Impacts - Asset Damage					
Hazard No.	Hazard Type		Current Asset Damage	Projected Change	Rationale
1		River flood	Major	Major	Densification of urban areas to deliver compact growth will potentially increase the amount of properties at risk of flooding. However, the Wexford CDP outlines an objective to ensure vulnerable developments are directed away from areas at risk of flooding. Works will also be continued with OPW to develop flood relief schemes and maintain existing defences. There is a likely increase in river flows across most of the country leading to an increase in severity of flooding (Climate Ireland).
2		Pluvial flood	Moderate	Moderate	Similarly to river flooding, densification of urban areas will potentially increase the amount of properties at risk. Adaptation and spatial planning goals include the conversion of land at risk of flooding to less vulnerable uses e.g. parks, gardens and open spaces for natural habitats (Wexford CDP). Works will also be continued with OPW to develop flood relief schemes and maintain existing defences. When compared with an annual average rainfall of 1186mm for the period 1961-1990, the thirty year period 1990-2019 shows a 70mm or almost 7% increase in rainfall (Status of Ireland's Climate, EPA).
3		Above average precipitation	Moderate	Moderate	Future developments will be required to utilise sustainable urban drainage systems to control the release of water runoff in a managed way (Wexford CDP). However, this is for urban areas in particular. Rural locations will be susceptible to an increase in precipitation levels. The last decade from 2006 - 2015 has been the wettest period in the period 1711- 2016 and there is evidence of an increasing trend in winter rainfall and a decreasing trend in summer rainfall (Status of Ireland's Climate, EPA). This implies there is an increase in severity in winter periods but a reduction in summer periods.
4		Extreme precipitation	Moderate	Moderate	Future developments will be required to utilise sustainable urban drainage systems to control the release of water runoff in a managed way (Wexford CDP). When compared with an annual average rainfall of 1186mm for the period 1961-1990, the thirty year period 1990-2019 shows a 70mm or almost 7% increase in rainfall (Status of Ireland's Climate, EPA).
5		Severe windstorm	Moderate	Moderate	Current predictions indicate an increase in the intensity of windstorms (Climate Ireland), increasing the impacts involved.
6		Storm Surge	Moderate	Major	Climate actions in coastal areas include ensuring new developments in coastal areas are climate proofed and resilient to all elements of climate change (Wexford CDP). However, the goal to promote densification of urban areas will potentially increase the impact of storm surges. Increasing wave heights have been observed over the last 70 years in the North Atlantic with typical winter season trends of increases up to 20 cm per decade, along with a northward displacement of storm tracks (Status of Ireland's Climate, EPA).
7		Coastal erosion	Major	Major	Objectives set out in the Wexford CDP outline a goal of ensuring vulnerable developments are directed away from areas at risk in particular to coastal areas at risk of erosion and do not exacerbate erosion risk. However, existing infrastructure located along coastlines are currently at high risk of being abandoned due to erosion. The projected increase in the magnitude and intensity of storm wave heights will likely increase the impacts of coastal erosion (Climate Ireland). There is also an indication that the ocean acidity will likely increase.
8		Coastal flood	Major	Major	Climate actions include avoiding vulnerable development in areas under threat from coastal flooding, An increase in sea levels and an increase in the magnitude and intensity of storm wave heights are expected (Climate Ireland), leading to more severe coastal floods.
9		Increase in Relative Sea Level	Negligible	Minor	New developments are under guidance to be placed away from areas at risk of damage due to sea level rise, i.e., low lying regions (Wexford CDP). Satellite observations indicate that sea levels around Ireland have increased by approximately 2-3 mm per year since the 1990s (The Status of Ireland's Climate, EPA). This will affect developments currently located in aeras at risk of damage due to sea level rise.
10		Heatwave	Moderate	Moderate	Average surface air temperatures are expected to increase across all seasons which will likely increase the intensity of heatwaves (Climate Ireland). New building regulations and materials will be required for use in new developments to accommodate this, but there will also be an increase in the impact of heatwaves due to more compacted urban areas (Wexford CDP).
11		Drought	Moderate	Moderate	Average surface temperature are expected in increase, as well as a decrease in the levels of summer rainfall (Status of Ireland's Climate, EPA), leading to an increase in the impact of droughts.
12		Above average surface temperature	Negligible	Negligible	Average surface air temperatures across all seasons are expected to increase (Climate Ireland). New building design and materials will be introduced to accommodate hotter summers without compromising resilience to other climate changes, but densification of urban areas will potentially increase the solar radiation of urban areas (Wexford CDP).
13		Cold spell	Moderate	Moderate	No changes in the assets affected. There has been a decrease in the number of frost days (temperatures below 0°C) and a shortening of the frost season duration, with projections to be in line with current trends (Climate Ireland). However, the impact remains as a minor impact.
14		Heavy snowfall	Minor	Minor	No changes in the assets affected. Snowfall is projected to decrease substantially by the middle of the century (Nolan and Flanagan), but impacts will remain the same.

Assessment of Future Climate Impacts - Health and Wellbeing

Hazard No.	Hazard Type		Current Health and Wellbeing Impact	Projected Change	Rationale
1		River flood	Major	Major	Densification of urban areas to deliver compact growth will potentially increase the amount of properties at risk of flooding. However, the Wexford CDP outlines an objective to ensure vulnerable developments are directed away from areas at risk of flooding. Works will also be continued with OPW to develop flood relief schemes and maintain existing defences. There is a likely increase in river flows across most of the country leading to an increase in severity of flooding (Climate Ireland).
2		Pluvial flood	Minor	Minor	The Wexford CDP outlines an objective to ensure vulnerable developments are directed away from areas at risk of flooding. Compared with an annual average rainfall of 1186mm for the period 1961-1990, the thirty year period 1990-2019 shows a 70mm or almost 7% increase in rainfall (Status of Ireland's Climate, EPA).
3		Above average precipitation	Minor	Minor	No change in health and wellbeing. The last decade from 2006 - 2015 has been the wettest period in the period 1711- 2016 and there is evidence of an increasing trend in winter rainfall and a decreasing trend in summer rainfall (Status of Ireland's Climate, EPA). This implies there is an increase in severity in winter periods but a reduction in summer periods.
4		Extreme precipitation	Moderate	Moderate	When compared with an annual average rainfall of 1186mm for the period 1961-1990, the thirty year period 1990-2019 shows a 70mm or almost 7% increase in rainfall (Status of Ireland's Climate, EPA). This increase in rainfall intensity is seen during the winter season while summers will see a decrease in the level of precipitation, balancing one another.
5		Severe windstorm	Moderate	Major	Changing demographics with an increase in elderly population and densification of urban areas will potentially increase exposure and vulnerability (Wexford LECP). Current predictions indicate an increase in the intensity of windstorms (Climate Ireland), increasing the impacts involved.
6		Storm Surge	Moderate	Major	Changing demographics with an increase in elderly population and densification of urban areas will potentially increase exposure and vulnerability (Wexford LECP). Increasing wave heights have been observed over the last 70 years in the North Atlantic with typical winter season trends of increases up to 20 cm per decade, along with a northward displacement of storm tracks (Status of Ireland's Climate, EPA).
7		Coastal erosion	Moderate	Moderate	Objectives set out in the Wexford CDP outline a goal of ensuring vulnerable developments are directed away from areas at risk in particular to coastal areas at risk of erosion. Vulnerabilities are unlikely to change. The projected increase in the magnitude and intensity of storm wave heights will likely increase the impacts of coastal erosion (Climate Ireland). There is also indication that the ocean acidity will likely increase.
8		Coastal flood	Moderate	Moderate	Objectives set out in the Wexford CDP outline a goal of ensuring vulnerable developments are directed away from areas at risk in particular to coastal areas at risk of flooding. An increase in sea levels and an increase in the magnitude and intensity of storm wave heights are expected (Climate Ireland), leading to more severe coastal floods.
9		Increase in Relative Sea Level	Negligible	Negligible	Changing demographics with an increase in elderly population and densification of urban areas will potentially increase exposure and vulnerability (Wexford LECP). Satellite observations indicate that sea levels around Ireland have increased by approximately 2-3 mm per year since the 1990s (The Status of Ireland's Climate, EPA) and if this trend continues, the impact on health and well being will likely increase.
10		Heatwave	Moderate	Moderate	Average surface air temperatures are expected to increase across all seasons which will likely increase the intensity of heatwaves (Climate Ireland). Protecting and expanding green infrastructure will help to reduce the increase in intensity of this event (Wexford CDP).
11		Drought	Moderate	Major	Changing demographics with an increase in elderly population and densification of urban areas will potentially increase exposure and vulnerability (Wexford LECP). Average surface temperature are expected in increase, as well as a decrease in the levels of summer rainfall (Status of Ireland's Climate, EPA).
12		Above average surface temperature	Minor	Minor	Average surface air temperatures across all seasons are expected to increase (Climate Ireland). Adaptation goals for County Wexford include the expansion of the county's green infrastructure, reducing any impacts to health and wellbeing by ensuring the presence of facilities to use in high temperatures (Wexford CDP).
13		Cold spell	Minor	Minor	Increase in vulnerable population, e.g., elderly population, may increase the possible impacts (Wexford LECP). However, there has been a decrease in the number of frost days (temperatures below 0°C) and a shortening of the frost season duration, with projections to be in line with current trends (Climate Ireland). However, the impact remains as a minor impact.
14		Heavy snowfall	Minor	Minor	The increasing elderly population increases the possible impacts of heavy snowfalls (Wexford LECP). However, snowfall is projected to decrease substantially by the middle of the century (Nolan and Flanagan), but impacts will remain the same.

Assessment of Future Climate Impacts - Environment					
Hazard No.	Hazard Type		Current Environment Impact	Projected Change	Rationale
1		River flood	Moderate	Moderate	Actions to mitigate impacts include managing development in flood risk areas and requiring SuDS to be used in all relevant developments to avoid surface water run-off and pollutants entering watercourses (Wexford CDP). There is a likely increase in river flows across most of the country leading to an increase in severity of flooding (Climate Ireland).
2		Pluvial flood	Minor	Moderate	Actions to mitigate impacts include managing development in flood risk areas and requiring SuDS to be used in all relevant developments to avoid surface water run-off and pollutants entering watercourses (Wexford CDP). When compared with an annual average rainfall of 1186mm for the period 1961-1990, the thirty year period 1990-2019 shows a 70mm or almost 7% increase in rainfall (Status of Ireland's Climate, EPA).
3		Above average precipitation	Minor	Minor	Requirement for the use of SuDS in new developments mitigate the effects of impacts to the environment (Wexford CDP). The last decade from 2006 - 2015 has been the wettest period in the period 1711- 2016 and there is evidence of an increasing trend in winter rainfall and a decreasing trend in summer rainfall (Status of Ireland's Climate, EPA). This implies there is an increase in severity in winter periods but a reduction in summer periods.
4		Extreme precipitation	Minor	Moderate	Requirement for the use of SuDS in new developments mitigate the effects of impacts to the environment (Wexford CDP). When compared with an annual average rainfall of 1186mm for the period 1961-1990, the thirty year period 1990-2019 shows a 70mm or almost 7% increase in rainfall (Status of Ireland's Climate, EPA).
5		Severe windstorm	Moderate	Major	Current predictions indicate an increase in the intensity of windstorms (Climate Ireland), increasing the impacts involved. Protection measures are being implemented on ecosystems such as dune habitat systems (Wexford CDP).
6		Storm Surge	Moderate	Major	Increasing wave heights have been observed over the last 70 years in the North Atlantic with typical winter season trends of increases up to 20 cm per decade, along with a northward displacement of storm tracks (Status of Ireland's Climate, EPA). Goals are in place to enhance the biodiversity and ecosystems (Wexford CDP).
7		Coastal erosion	Major	Major	The projected increase in the magnitude and intensity of storm wave heights will likely increase the impacts of coastal erosion (Climate Ireland). There is also indication that the ocean acidity will likely increase. The Council will continue to work with GSI and the OPW to ensure that risks posed by coastal erosion are carefully managed so as to protect coastal habitats (Wexford CDP).
8		Coastal flood	Moderate	Major	Actions to mitigate impacts include managing development in flood risk areas in all relevant developments to avoid surface water run-off and pollutants entering watercourses (Wexford CDP). An increase in sea levels and an increase in the magnitude and intensity of storm wave heights are expected (Climate Ireland), leading to more severe coastal floods.
9		Increase in Relative Sea Level	Minor	Minor	Satellite observations indicate that sea levels around Ireland have increased by approximately 2-3 mm per year since the 1990s (The Status of Ireland's Climate, EPA). This may increase the growth of marine habitats in near shallow waters, but reduce habitats which live on the coastlines.
10		Heatwave	Moderate	Major	Changes in phenology are projected to be experienced as average surface air temperatures are expected to increase across all seasons which will likely increase the intensity of heatwaves (Climate Ireland). This will affect the blooming seasons of flora, affecting the pollinating cycle.
11		Drought	Moderate	Major	Given the overall effect of climate change on environmental assets, many will be stressed from a range of factors, reducing the capacity of these assets to sustain acute and chronic events leading to an expected increase in impact. Average surface temperature are expected in increase, as well as a decrease in the levels of summer rainfall (Status of Ireland's Climate, EPA).
12		Above average surface temperature	Major	Catastrophic	Changes in phenology are projected to be experienced as average surface air temperatures across all seasons are expected to increase (Climate Ireland). This will affect the blooming seasons of flora, affecting the pollinating cycle.
13		Cold spell	Negligible	Negligible	There has been a decrease in the number of frost days (temperatures below 0°C) and a shortening of the frost season duration, with projections to be in line with current trends (Climate Ireland). However, the impact remains negligible.
14		Heavy snowfall	Minor	Minor	Snowfall is projected to decrease substantially by the middle of the century (Nolan and Flanagan), but impacts will remain the same.

Assessment of Future Climate Impacts - Social				
Hazard No.	Hazard Type	Current Social Impact	Projected Change	Rationale
1	River flood	Moderate	Moderate	Actions to avoid locating vulnerable developments in areas at risk of flooding are envisaged (Wexford CDP). There is a likely increase in river flows across most of the country leading to an increase in severity of flooding (Climate Ireland).
2	Pluvial flood	Minor	Minor	Actions to avoid locating vulnerable developments in areas at risk of flooding are envisaged (Wexford CDP). When compared with an annual average rainfall of 1186mm for the period 1961-1990, the thirty year period 1990-2019 shows a 70mm or almost 7% increase in rainfall (Status of Ireland's Climate, EPA).
3	Above average precipitation	Minor	Minor	Ensuring adequate availability/knowledge of meaningful physical activity (Wexford LECP). The last decade from 2006 - 2015 has been the wettest period in the period 1711- 2016 and there is evidence of an increasing trend in winter rainfall and a decreasing trend in summer rainfall (Status of Ireland's Climate, EPA). This implies there is an increase in severity in winter periods but a reduction in summer periods.
4	Extreme precipitation	Minor	Minor	Ensuring adequate availability/knowledge of meaningful physical activity (Wexford LECP). When compared with an annual average rainfall of 1186mm for the period 1961-1990, the thirty year period 1990-2019 shows a 70mm or almost 7% increase in rainfall (Status of Ireland's Climate, EPA).
5	Severe windstorm	Minor	Minor	Changing demographics with an increasing elderly population and densification of urban areas will potentially increase exposure and vulnerability (Wexford LECP). Current predictions indicate an increase in the intensity of windstorms (Climate Ireland), increasing the impacts involved for the vulnerable population, e.g., the homeless.
6	Storm Surge	Minor	Minor	Changing demographics with an increasing elderly population and densification of urban areas will potentially increase exposure and vulnerability (Wexford LECP). Increasing wave heights have been observed over the last 70 years in the North Atlantic with typical winter season trends of increases up to 20 cm per decade, along with a northward displacement of storm tracks (Status of Ireland's Climate, EPA).
7	Coastal erosion	Minor	Moderate	Actions to avoid locating vulnerable developments in areas at risk of coastal erosion are envisaged (Wexford CDP). The projected increase in the magnitude and intensity of storm wave heights will likely increase the impacts of coastal erosion (Climate Ireland). There is also indication that the ocean acidity will likely increase.
8	Coastal flood	Moderate	Moderate	Actions to avoid locating vulnerable developments in areas at risk of flooding are envisaged (Wexford CDP). An increase in sea levels and an increase in the magnitude and intensity of storm wave heights are expected (Climate Ireland), leading to more severe coastal floods.
9	Increase in Relative Sea Level	Negligible	Negligible	Satellite observations indicate that sea levels around Ireland have increased by approximately 2-3 mm per year since the 1990s (The Status of Ireland's Climate, EPA), however, no social impacts are expected to increase.
10	Heatwave	Minor	Moderate	Changing demographics with an increasing elderly population and densification of urban areas will potentially increase exposure and vulnerability (Wexford LECP). Average surface air temperatures are expected to increase across all seasons which will likely increase the intensity of heatwaves (Climate Ireland).
11	Drought	Moderate	Moderate	Changing demographics with an increasing elderly population and densification of urban areas will potentially increase exposure and vulnerability however, not enough to make this a moderate future impact. Average surface temperature are expected in increase, as well as a decrease in the levels of summer rainfall (Status of Ireland's Climate, EPA).
12	Above average surface temperature	Minor	Minor	Average surface air temperatures across all seasons are expected to increase (Climate Ireland). Uncomfortable conditions for more vulnerable population may be at risk of an increased impact.
13	Cold spell	Minor	Minor	There has been a decrease in the number of frost days (temperatures below 0°C) and a shortening of the frost season duration, with projections to be in line with current trends (Climate Ireland). However, the impact remains as a minor impact.
14	Heavy snowfall	Negligible	Negligible	Snowfall is projected to decrease substantially by the middle of the century (Nolan and Flanagan), but impacts will remain the same.

Assessment of Future Climate Impacts - Financial					
Hazard No.	Hazard Type		Current Financial Impact	Projected Change	Rationale
1		River flood	Moderate	Major	The increase in impact across a range of areas of the local authority could lead to an increasing financial burden on the local authority (Wexford CDP). There is a likely increase in river flows across most of the country leading to an increase in severity of flooding (Climate Ireland).
2		Pluvial flood	Minor	Minor	The increase in impact across a range of areas of the local authority could lead to an increasing financial burden on the local authority (Wexford CDP). When compared with an annual average rainfall of 1186mm for the period 1961-1990, the thirty year period 1990-2019 shows a 70mm or almost 7% increase in rainfall (Status of Ireland's Climate, EPA).
3		Above average precipitation	Negligible	Negligible	The last decade from 2006 - 2015 has been the wettest period in the period 1711- 2016 and there is evidence of an increasing trend in winter rainfall and a decreasing trend in summer rainfall (Status of Ireland's Climate, EPA). This implies there is an increase in severity in winter periods but a reduction in summer periods. It is unlikely the financial burden will be increased.
4		Extreme precipitation	Minor	Minor	When compared with an annual average rainfall of 1186mm for the period 1961-1990, the thirty year period 1990-2019 shows a 70mm or almost 7% increase in rainfall (Status of Ireland's Climate, EPA).
5		Severe windstorm	Minor	Minor	The increase in impact across a range of areas of the local authority could lead to an increasing financial burden on the local authority (Wexford CDP). Current predictions indicate an increase in the intensity of windstorms (Climate Ireland), increasing the impacts involved.
6		Storm Surge	Minor	Moderate	The increase in impact across a range of areas of the local authority could lead to an increasing financial burden on the local authority (Wexford CDP). Increasing wave heights have been observed over the last 70 years in the North Atlantic with typical winter season trends of increases up to 20 cm per decade, along with a northward displacement of storm tracks (Status of Ireland's Climate, EPA).
7		Coastal erosion	Moderate	Moderate	The increase in impact across a range of areas of the local authority could lead to an increasing financial burden on the local authority (Wexford CDP). However, the indirect consequences of these impacts are unknown which could lead to an increase in financial burden for the local authority. The projected increase in the magnitude and intensity of storm wave heights will likely increase the impacts of coastal erosion (Climate Ireland). There is also indication that the ocean acidity will likely increase.
8		Coastal flood	Moderate	Moderate	The increase in impact across a range of areas of the local authority could lead to an increasing financial burden on the local authority (Wexford CDP). An increase in sea levels and an increase in the magnitude and intensity of storm wave heights are expected (Climate Ireland), leading to more severe coastal floods.
9		Increase in Relative Sea Level	Negligible	Minor	Satellite observations indicate that sea levels around Ireland have increased by approximately 2-3 mm per year since the 1990s (The Status of Ireland's Climate, EPA) and if this trend continues, the impact on finances will likely increase.
10		Heatwave	Negligible	Minor	Average surface air temperatures are expected to increase across all seasons which will likely increase the intensity of heatwaves (Climate Ireland).
11		Drought	Minor	Moderate	Average surface temperature are expected in increase, as well as a decrease in the levels of summer rainfall (Status of Ireland's Climate, EPA). Drier summers result in an increasing financial burden for the provision of water.
12		Above average surface temperature	Negligible	Negligible	Average surface air temperatures across all seasons are expected to increase (Climate Ireland). A possible increase in the measures to protect and enhance green infrastructure to accommodate this increase in baseline temperatures may lead to an increased burden on finances, but not enough to create minor impacts.
13		Cold spell	Minor	Minor	There has been a decrease in the number of frost days (temperatures below 0°C) and a shortening of the frost season duration, with projections to be in line with current trends (Climate Ireland). However, the impact remains as a minor impact.
14		Heavy snowfall	Minor	Minor	Snowfall is projected to decrease substantially by the middle of the century (Nolan and Flanagan), but impacts will remain the same.

Assessment of Future Climate Impacts - Reputational

Hazard No.	Hazard Type	Current Reputational Impact	Projected Change	Rationale
1	River flood	Moderate	Moderate	There is a likely increase in river flows across most of the country leading to an increase in severity of flooding (Climate Ireland). The local authority has a role in addressing these issues, and could therefore suffer reputational damage from local, national, and international perspectives. The CARO progress report 2022 indicates progress has been made with regards to climate change adaptation implementation with this event.
2	Pluvial flood	Minor	Moderate	When compared with an annual average rainfall of 1186mm for the period 1961-1990, the thirty year period 1990-2019 shows a 70mm or almost 7% increase in rainfall (Status of Ireland's Climate, EPA). The local authority has a role in addressing these issues, and could therefore suffer reputational damage from local, national, and international perspectives.
3	Above average precipitation	Negligible	Negligible	The last decade from 2006 - 2015 has been the wettest period in the period 1711- 2016 and there is evidence of an increasing trend in winter rainfall and a decreasing trend in summer rainfall (Status of Ireland's Climate, EPA). This implies there is an increase in severity in winter periods but a reduction in summer periods. The local authority has a role in addressing these issues, and could therefore suffer reputational damage from local, national, and international perspectives. The CARO progress report 2022 indicates progress has been made with regards to climate change adaptation implementation.
4	Extreme precipitation	Moderate	Moderate	When compared with an annual average rainfall of 1186mm for the period 1961-1990, the thirty year period 1990-2019 shows a 70mm or almost 7% increase in rainfall (Status of Ireland's Climate, EPA).The local authority has a role in addressing these issues, and could therefore suffer reputational damage from local, national, and international perspectives. The CARO progress report 2022 indicates progress has been made with regards to climate change adaptation implementation.
5	Severe windstorm	Negligible	Negligible	Current predictions indicate an increase in the intensity of windstorms (Climate Ireland), increasing the impacts involved. The local authority has a role in addressing these issues, and could therefore suffer reputational damage from local, national, and international perspectives. The CARO progress report 2022 indicates progress has been made with regards to climate change adaptation implementation.
6	Storm Surge	Negligible	Negligible	Increasing wave heights have been observed over the last 70 years in the North Atlantic with typical winter season trends of increases up to 20 cm per decade, along with a northward displacement of storm tracks (Status of Ireland's Climate, EPA). The local authority has a role in addressing these issues, and could therefore suffer reputational damage from local, national, and international perspectives. The CARO progress report 2022 indicates progress has been made with regards to climate change adaptation implementation.
7	Coastal erosion	Minor	Moderate	The projected increase in the magnitude and intensity of storm wave heights will likely increase the impacts of coastal erosion (Climate Ireland). There is also indication that the ocean acidity will likely increase. The local authority has a role in addressing these issues, and could therefore suffer reputational damage from local, national, and international perspectives.
8	Coastal flood	Moderate	Moderate	An increase in sea levels and an increase in the magnitude and intensity of storm wave heights are expected (Climate Ireland), leading to more severe coastal floods. The local authority has a role in addressing these issues, and could therefore suffer reputational damage from local, national, and international perspectives. The CARO progress report 2022 indicates progress has been made with regards to climate change adaptation implementation.
9	Increase in Relative Sea Level	Negligible	Negligible	Satellite observations indicate that sea levels around Ireland have increased by approximately 2-3 mm per year since the 1990s (The Status of Ireland's Climate, EPA) and if this trend continues, the impact on reputation will likely increase. The local authority has a role in addressing these issues, and could therefore suffer reputational damage from local, national, and international perspectives. The CARO progress report 2022 indicates progress has been made with regards to climate change adaptation implementation.
10	Heatwave	Minor	Minor	Average surface air temperatures are expected to increase across all seasons which will likely increase the intensity of heatwaves (Climate Ireland). The local authority has a role in addressing these issues, and could therefore suffer reputational damage from local, national, and international perspectives. The CARO progress report 2022 indicates progress has been made with regards to climate change adaptation implementation.
11	Drought	Minor	Moderate	Average surface temperature are expected in increase, as well as a decrease in the levels of summer rainfall (Status of Ireland's Climate, EPA).The local authority has a role in addressing these issues, and could therefore suffer reputational damage from local, national, and international perspectives.
12	Above average surface temperature	Negligible	Negligible	Average surface air temperatures across all seasons are expected to increase (Climate Ireland). The local authority has a role in addressing these issues, and could therefore suffer reputational damage from local, national, and international perspectives. The CARO progress report 2022 indicates progress has been made with regards to climate change adaptation implementation.
13	Cold spell	Negligible	Negligible	There has been a decrease in the number of frost days (temperatures below 0°C) and a shortening of the frost season duration, with projections to be in line with current trends (Climate Ireland). However, the impact remains negligible.
14	Heavy snowfall	Negligible	Negligible	Snowfall is projected to decrease substantially by the middle of the century (Nolan and Flanagan), but impacts will remain the same.

Assessment of Future Climate Impacts - Cultural Heritage

Hazard No.	Hazard Type		Current Cultural Heritage Impact	Projected Change	Rationale
1		River flood	Moderate	Major	There could be an increase in the number of cultural heritage assets exposed to river flooding due to an increase in severity of flooding events. There is a likely increase in river flows across most of the country leading to an increase in severity of flooding (Climate Ireland). The objective is to continue to work alongside OPW to carry out flood relief schemes and maintain existing defences (Wexford CDP).
2		Pluvial flood	Minor	Moderate	There could be an increase in the number of cultural heritage assets exposed to pluvial flooding due to an increase in severity of flooding events, and an increase in the overall impact is expected. When compared with an annual average rainfall of 1186mm for the period 1961-1990, the thirty year period 1990-2019 shows a 70mm or almost 7% increase in rainfall (Status of Ireland's Climate, EPA). The objective is to continue to work alongside OPW to carry out flood relief schemes and maintain existing defences (Wexford CDP).
3		Above average precipitation	Moderate	Moderate	Above average precipitation does not impact the majority of cultural heritage assets so a significant increase in overall impact is not envisaged. The last decade from 2006 - 2015 has been the wettest period in the period 1711- 2016 and there is evidence of an increasing trend in winter rainfall and a decreasing trend in summer rainfall (Status of Ireland's Climate, EPA). This implies there is an increase in severity in winter periods but a reduction in summer periods.
4		Extreme precipitation	Moderate	Moderate	Extreme precipitation does not impact the majority of cultural heritage assets so a significant increase in overall impact is not envisaged. When compared with an annual average rainfall of 1186mm for the period 1961-1990, the thirty year period 1990-2019 shows a 70mm or almost 7% increase in rainfall (Status of Ireland's Climate, EPA).
5		Severe windstorm	Moderate	Moderate	The projected changes in severe windstorms indicate a reduction in lesser storms but an increase in major storms. The overall impact is expected to remain relatively unchanged as storms may be less frequent but the damage caused may increase. Current predictions indicate an increase in the intensity of windstorms (Climate Ireland), increasing the impacts involved.
6		Storm Surge	Minor	Moderate	Storm surges are damaging to cultural assets located on the coasts and prevent the provision of cultural trails along the coast (Wexford LECP). Increasing wave heights have been observed over the last 70 years in the North Atlantic with typical winter season trends of increases up to 20 cm per decade, along with a northward displacement of storm tracks (Status of Ireland's Climate, EPA).
7		Coastal erosion	Moderate	Major	Coastal erosion is a risk to the ringforts present on the coasts of Wexford. The projected increase in the magnitude and intensity of storm wave heights will likely increase the impacts of coastal erosion (Climate Ireland). There is also indication that the ocean acidity will likely increase.
8		Coastal flood	Moderate	Major	There could be an increase in the number of cultural heritage assets exposed to coastal flooding due to an increase in severity and frequency of flooding events, and an increase in the overall impact is expected. An increase in sea levels and an increase in the magnitude and intensity of storm wave heights are expected (Climate Ireland), leading to more severe coastal floods. The objective is to continue to work alongside OPW to carry out flood relief schemes and maintain existing defences (Wexford CDP).
9		Increase in Relative Sea Level	Minor	Minor	Increased sea levels may increase the risk to cultural heritage on the coast, e.g., ringforts, and lead to closure or the submersion of these assets. Satellite observations indicate that sea levels around Ireland have increased by approximately 2-3 mm per year since the 1990s (The Status of Ireland's Climate, EPA).
10		Heatwave	Moderate	Moderate	Areas of cultural heritage may have an increase in visitors during these events, increasing pressure on these areas, but not enough to increase the impact. Average surface air temperatures are expected to increase across all seasons which will likely increase the intensity of heatwaves (Climate Ireland).
11		Drought	Minor	Minor	Droughts do not impact the majority of cultural heritage assets so a significant increase in overall impact is not envisaged (Wexford CDP). Average surface temperature are expected in increase, as well as a decrease in the levels of summer rainfall (Status of Ireland's Climate, EPA).
12		Above average surface temperature	Moderate	Moderate	Areas of cultural heritage may have an increase in visitors as a result of increased average surface temperatures, increasing pressure on these areas, but not enough to increase a major impact. Average surface air temperatures across all seasons are expected to increase (Climate Ireland).
13		Cold spell	Minor	Minor	Cold spells do not impact the majority of cultural heritage assets so a significant increase in overall impact is not envisaged. There has been a decrease in the number of frost days (temperatures below 0°C) and a shortening of the frost season duration, with projections to be in line with current trends (Climate Ireland). However, the impact remains as a minor impact.
14		Heavy snowfall	Minor	Minor	Heavy snowfalls do not impact the majority of cultural heritage assets so a significant increase in overall impact is not envisaged. Snowfall is projected to decrease substantially by the middle of the century (Nolan and Flanagan), but impacts will remain the same.

Appendix G Future Impact Summary Matrix

FUTURE IMPACTS

Hazard Type		Projected Frequency	Projected Frequency (Score)	Asset Damage	Health and Wellbeing	Environment	Social	Financial	Reputation	Cultural Heritage	Projected Impact
	River flood	Frequent	4	Major	Major	Moderate	Moderate	Major	Moderate	Major	3.57
	Coastal flood	Frequent	4	Major	Moderate	Major	Moderate	Moderate	Moderate	Major	3.43
	Coastal erosion	Very Frequent	5	Major	Moderate	Major	Moderate	Moderate	Moderate	Major	3.43
	Drought	Frequent	4	Moderate	Major	Major	Moderate	Moderate	Moderate	Minor	3.14
	Storm Surge	Frequent	4	Major	Major	Major	Minor	Moderate	Negligible	Moderate	3.00
	Heatwave	Frequent	4	Moderate	Moderate	Major	Moderate	Minor	Minor	Moderate	2.86
	Extreme precipitation	Very Frequent	5	Moderate	Moderate	Moderate	Minor	Minor	Moderate	Moderate	2.71
	Severe windstorm	Very Frequent	5	Moderate	Major	Major	Minor	Minor	Negligible	Moderate	2.71
	Pluvial flood	Frequent	4	Moderate	Minor	Moderate	Minor	Minor	Moderate	Moderate	2.57
	Above average surface temperature	Frequent	4	Negligible	Minor	Catastrophic	Minor	Negligible	Negligible	Moderate	2.14
	Above average precipitation	Frequent	4	Moderate	Minor	Minor	Minor	Negligible	Negligible	Moderate	2.00
	Cold spell	Occasional	2	Moderate	Minor	Negligible	Minor	Minor	Negligible	Minor	1.86
	Heavy snowfall	Occasional	2	Minor	Minor	Minor	Negligible	Minor	Negligible	Minor	1.71
	Increase in Relative Sea Level	Common	3	Minor	Negligible	Minor	Negligible	Minor	Negligible	Minor	1.57