

From: Rebecca Spore, Director of Infrastructure
To: Kent Flood Risk Management Committee – 14th November 2023
Subject: Environment Agency and Met Office Alerts and Warnings and KCC severe weather response activity.
Classification: Unrestricted

Summary: To update Kent Flood Risk Management Committee on the current water situation, weather statistics, Environment Agency and Met Office Warnings, and flood response activity since the last meeting of the Committee on 12th July 2023.

1. Background

- 1.1 This report is the latest of the regular updates to the Committee addressing the current water situation and recent severe weather and associated emergency response activity in Kent.
- 1.2 The KCC Resilience and Emergency Planning Service Duty Emergency Planning Officer (DEPO) and Contact Point receive Environment Agency (EA) and Met Office alerts and warnings regarding severe weather on a 24/7 basis. Any site-specific severe weather impacts are notified to the DEPO by the emergency services and other resilience partners, with reports from the public received by Contact Point and passed on to the DEPO and/or Kent Highways. DEPO further initiates multiagency reporting using the County Council's innovative Severe Weather Impacts System (SWIMS) to capture resources and costs arising from severe weather incidents.
- 1.3 Some 85,500 residential and commercial addresses across Kent are located within areas identified as at risk from fluvial (river) or tidal (coastal) flooding. Where possible, flood vulnerable properties are offered a Flood Warning Service by the EA. Early warning of flood risk to communities (including areas outside of floodplains) is delivered through Flood Guidance Statements, Severe Weather Warnings and mobilisation of the Kent Resilience Forum (KRF) Severe Weather Advisory Group (SWAG).

2. Kent water situation and weather statistics

- 2.1 July 2023 recorded rainfall 151% above the long-term average for Kent, with temperatures around average. This wet start to the summer assisted further the trend towards local recovery of groundwater, soil moisture deficits and river flows seen in the spring, following the extended period of drought experienced in 2022, which only saw Kent move into recovery status in January 2023.
- 2.2 August was a drier month across the County, with 90% of long-term rainfall average recorded, with mean temperatures again around average.
- 2.3 This drier trend intensified in September, which saw just 57% of long-term average rainfall. However, the key headline was the very warm weather,

exceeding the mean maximum temperature by +3.8°C and making it the joint warmest September on record (in a series which goes back to 1884).

- 2.4 An unseasonably wet and warm October saw 167% of long-term average rainfall and temperatures +2.4% above the mean maximum.
- 2.5 2nd November saw Kent's Channel coast battered by Storm Ciarán, with a wind speed of 78 mph recorded at Langdon Bay and some significant rainfall totals recorded across the County. Impacts from the named storm saw some 10,000 addresses affected by power outages (including critical infrastructure), significant disruption to ferry and rail services (triggering Brock Zero), dislocation across parts of the strategic and local road networks (with the County Council's out-of-hours contact centre handling 500% of usual call volumes), more than 20 schools were closed and floodwater was impounded at Leigh Flood Storage Area, Aldington and Hothfield Reservoirs.
- 2.6 In terms of command and control for Storm Ciarán, the County Council initiated internal Cross Directorate Resilience Forum meetings and multi-agency SWAG, Tactical Co-ordinating Group (TCG) and Strategic Co-ordinating Group (SCG) meetings between 30th October and 2nd November. Rebecca Spore (Director of Infrastructure) chaired the Cross Directorate Resilience Forum, while Tony Harwood (Resilience and Emergency Planning Manager) chaired the SWAG and TCG, and Jim Beale (Director of Adult Social Care) chaired the SCG. A Media and Communications Cell was also established to co-ordinate vital warning and informing activities.
- 2.6 The latest river flow data available from the Environment Agency, covering September, saw most catchments within the **normal** category. The River Stour at Horton and East Stour at South Willesborough being the only two monitoring sites where **below normal** monthly mean river flows were observed. **Above normal** flows were only observed on the River Dour at Crabble Mill, heavily supported by groundwater.
- 2.7 Groundwater levels were **normal** in the Kentish Lower Greensand and most Kent chalk aquifers, the exception being in east Kent. Groundwater levels across the whole area declined during September in line with below average rainfall, with any variation from recent rainfall yet to be assessed.
- 2.8 Levels at the Bough Beech and Bewl Reservoirs were at 59% and 70% of overall capacity respectively by the end of September, both **normal** for the time of year. Levels at all Kent reservoirs declined in September but have experienced some recharge during the wet October and early November.
- 2.9 54 flood alerts and warnings were issued by the EA since the last meeting of the Committee (24 fluvial and 30 coastal)¹. This contrasts with nine flood alerts in the corresponding period in 2022 (four fluvial and five coastal).

¹ Please see appendix 1

- 2.10 The Met Office issued 41 yellow and two amber weather warnings between June and 3rd November 2023 (20 for rain, 22 for thunderstorm, seven for wind and one for wind and rain)².
- 2.11 The Thames Barrier was closed on five occasions since the last meeting of the Committee (one for operational and four for test purposes)³. The figure for the corresponding period last year was three (all for test purposes).
- 2.12 Kent's 326-mile coastline encompasses iconic seascapes, internationally significant wildlife habitats and seaside towns with economies integrally linked with the health of our marine environment. During the summer of 2023, a marine heatwave developed in the northeast Atlantic, leading to pockets of extremely warm water around parts of the UK, including in the North Sea and English Channel. The surface temperature of the world's oceans hit their highest ever level during August 2023, when global average daily sea surface temperatures (SST) reached 20.96°C, breaking the previous 2016 record of 20.95°C, according to the European Union Copernicus Climate Modelling Service.
- 2.13 The drivers of this phenomenon are complex but are likely to include weaker trade winds leading to lower evaporation and more uptake of solar radiation. An El Niño event is also underway in the tropical Pacific, this is the warm phase of the Pacific's natural cycle, and it can last up to 2 years. During El Niño events the global oceans tend to store more heat than usual. There may also be other more complicated feedbacks involved in driving the UK's marine heatwaves. These natural warming events must be superimposed onto recent anthropogenic ocean warming - therefore the starting point is higher (around 1°C on average in the North Atlantic). The latest data from Centre for Environment, Fisheries and Aquaculture Science shows that sea surface warming around the UK to date has been more intense in the shallower North Sea than in the deeper western waters, with the most rapid rise being observed in the southern North Sea. The warmest sea temperature recorded in UK waters on the 3rd November 2023 was 15.7°C at Dover, the ten year average for this location is 13.5°C at this time of year.

3. Recent Flood Incident Response and Exercises

- 3.1 The Medway Confluence Plan was triggered on 2nd November, in response to heavy rainfall associated with Storm Ciarán, with a series of multi-agency meetings progressed to manage local impacts and Environment Agency assets deployed.
- 3.2 On 10th October the County Council participated, alongside Environment Agency colleagues, in a Kent Fire and Rescue Service training event at the Kent and Medway Road Safety Experience, Rochester.

² Please see appendix 2

³ Please see appendix 3

4. Outlook

- 4.1 The Met Office three-month outlook summary indicates a 20% chance that November to January will be milder than average (1.0 times the normal chance), a 65% chance that it will be near average (1.1 times the usual chance) and a 15% chance that it will be colder than average (0.8 times the usual chance). In terms of rainfall, the summary indicates a 15% chance the season will be drier than average, 60% chance that it will be near average and a 25% chance it will be wetter than average. As regards likely wind speeds, the summary suggests a 20% chance that it will be calmer than average, a 65% chance that they will be near average and 15% chance of windier than average conditions.
- 4.2 The EA continuously runs surge forecasts, informed by astronomical tide calculations. If a risk of coastal flooding is forecast, then this information is communicated to partners. Indeed, the next notably high equinoctial spring tides, with a corresponding elevated risk of coastal flooding, if in combination with high winds, are forecast for 26th – 28th November. However, coastal flooding can still occur outside of high spring tides.
- 4.3 Kent Flood Risk Management Committee will continue to receive regular updates on water resources, flood alerts, weather warnings and response.

5. Recommendations

- 5.1 The Committee is asked to note the warnings received since the last meeting of the Committee.

6. Contact Details

Report Author: Tony Harwood (Resilience and Emergency Planning Manager), Infrastructure, Deputy Chief Executive's Department, tel. 03000 413 386, e-mail tony.harwood@kent.gov.uk

Relevant Director: Rebecca Spore (Director of Infrastructure), Deputy Chief Executive's Department tel. 03000 412 064, email rebecca.spore@kent.gov.uk

Appendix 1: EA Flood Alerts and Warnings issued since 12th July 2023

Date issued	Flood Zone	Status
02/08/2023	Coast from St Margaret's at Cliffe to Sandgate	Flood Alert
02/08/2023	Coast from Ramsgate to Kingsdown	Flood Alert
02/08/2023	Isle of Sheppey and Coast from Kemsley to Seasalter	Flood Alert
02/08/2023	Shuttle and Cray	Flood Alert
03/08/2023	Coast from Whitstable to Margate	Flood Alert
03/08/2023	Isle of Sheppey and Coast from Kemsley to Seasalter	Flood Alert
03/08/2023	Tidal Medway, Medway estuary and Isle of Grain	Flood Alert
03/08/2023	Coast from Dartford to Allhallows	Flood Alert
31/08/2023	Isle of Sheppey and Coast from Kemsley to Seasalter	Flood Alert
01/09/2023	Coast from St Margaret's at Cliffe to Sandgate	Flood Alert
01/09/2023	Coast from Fairlight to Dungeness Including Tidal Rother	Flood Alert
01/09/2023	Coast from Sandgate to Dungeness	Flood Alert
01/09/2023	Coast from Dartford to Allhallows	Flood Alert
01/09/2023	Coast from Whitstable to Margate	Flood Alert
01/09/2023	Tidal Medway, Medway estuary and Isle of Grain	Flood Alert
03/09/2023	New Romney Sewage Arm Area	Flood Alert
03/09/2023	Tidal Thames riverside from Dartford Creek and The Mardyke to the Thames Barrier	Flood Alert
29/09/2023	Coast from St Margaret's at Cliffe to Sandgate	Flood Alert
29/09/2023	Coast from Ramsgate to Kingsdown	Flood Alert
01/10/2023	Coast from St Margaret's at Cliffe to Sandgate	Flood Alert
01/10/2023	Coast from Ramsgate to Kingsdown	Flood Alert
28/10/2023	New Romney Sewage Arm Area	Flood Alert
28/10/2023	Coast from Sandgate to Dungeness	Flood Alert
28/10/2023	Coast from Fairlight to Dungeness Including Tidal Rother	Flood Alert
29/10/2023	Rivers Eden and Eden Brook Area	Flood Alert
29/10/2023	Lower River Medway Area	Flood Alert
29/10/2023	Coast from St Margaret's at Cliffe to Sandgate	Flood Alert
29/10/2023	Coast from Ramsgate to Kingsdown	Flood Alert
30/10/2023	Tidal Medway, Medway estuary and Isle of Grain	Flood Alert
30/10/2023	Coast from Dartford to Allhallows	Flood Alert
30/10/2023	Isle of Sheppey and Coast from Kemsley to Seasalter	Flood Alert
30/10/2023	Coast from Whitstable to Margate	Flood Alert
30/10/2023	Tidal Stour Area from Fordwich to Stonar Cut	Flood Alert
31/10/2023	Tidal Thames riverside from Dartford Creek and The Mardyke to the Thames Barrier	Flood Alert
02/11/2023	River Bourne from Hadlow to East Peckham	Flood Alert
02/11/2023	Rivers Eden and Eden Brook Area	Flood Alert
02/11/2023	Upper River Stour	Flood Alert
02/11/2023	Upper River Medway Area	Flood Alert
02/11/2023	River Teise area from Lamberhurst to Goudhurst	Flood Alert
02/11/2023	River Darent from Westerham to Dartford	Flood Alert
02/11/2023	River Rother and its tributaries from Turks Bridge to the Royal Military Canal	Flood Alert
02/11/2023	Lower River Medway Area	Flood Alert
02/11/2023	Middle River Medway Area	Flood Alert

04/11/2023	Rivers Eden and Eden Brook Area	Flood Alert
04/11/2023	Upper River Medway Area	Flood Alert
04/11/2023	Middle River Medway Area	Flood Alert
04/11/2023	Lower River Medway Area	Flood Alert
04/11/2023	Upper River Stour	Flood Alert
04/11/2023	River Rother and its tributaries from Turks Bridge to the Royal Military Canal	Flood Alert
04/11/2023	New Romney Sewage Arm Area	Flood Warning
04/11/2023	Lower River Stour	Flood Alert
04/11/2023	River Beult from Pluckley	Flood Alert
04/11/2023	Whitewater and Ruckinge Dykes	Flood Warning
05/11/2023	Tidal Stour Area from Fordwich to Stonar Cut	Flood Alert

Appendix 2: Met Office Severe Weather Warnings – 1st June to 3rd November 2023

Weather Element	Number of Warnings	No of Different Events	Dates covered by Events
Rain	20	10	20 – 21 September 12 – 13, 19 – 20, 24 – 25, 27 – 30 October 4 November
Thunderstorm	22	14	10, 17 – 18, 20 June 8 July 2, 5, 18 – 19, 24 August 1, 12, 17-18 September
Wind	7	4	15 July 8 August 1 – 2 November
Wind and Rain	1	1	1-2 November

Appendix 3: Environment Agency Thames Barrier closures since 12th July 2023

Thames Barrier closures	Date	Status
Thames Barrier closed	21/08/23	Test
Thames Barrier closed	02/09/23	Test
Thames Barrier closed	03/09/23	Test
Thames Barrier closed	18/10/23	Test
Thames Barrier closed	31/10/23	Operational