

Polmont's Thunderstorm and Flash Floods of 11 and 12 August 2020

Kenny could not believe his eyes as he walked home from Polmont's Black Bull Inn. He was captivated by the forked lightning and the extremely dark clouds on the horizon, so much so he stopped to film it on his phone. At that time, he had no idea of the damage the storm would cause that night.

After witnessing the spectacular display, he went to bed, expecting a quiet night's sleep. However, the dark clouds soon rolled into his town. What used to be a once-in-a-hundred-year event has now, due to climate change, become an annual occurrence. That night marked Polmont's worst storm (so far). The lightning struck a butcher's shop in Brighton, burning it to the ground; it has never reopened.

Kenny finds this ironic as it's the meat and dairy industry, that's the main driver of global and local deforestation. Scotland is literally sheepwrecked, devoid of the massive forests that once covered the land, slaughter animals to feed a culture of butchers not farmers, has driven the loss of Scotland's forests. The country is now largely devoid of the massive woodlands that once covered the land, which could have provided a buffer for the townsfolk against such storms. This global climate emergency necessitates urgent action; we need to plant as many trees as possible to store carbon, protect biodiversity, and shield communities from flash floods and storm damage.

Additionally, the lightning struck a home next to the canal, displacing the family inside as their roof caught fire. The storm delivered over a month's worth of rain in just a few hours, causing local rivers to swell. This flooding was exacerbated by the dry conditions resulting from a prolonged hot spell without rain. Without trees to slow the water's flow, the immense volume surged through the town.

In Polmont, the canal could not manage the influx and burst its banks. The deluge ripped up the main Glasgow to Edinburgh railway line, tore tarmac off the roads, stripped away trees, and washed away footpaths and riverbanks. At Beancross, the car park at Klondyke flooded, displacing people staying in nearby hotels while their cars floated or sank in what became temporary lochs. One of these Lochans has since turned permanent due to flood repairs at the railway embankment.

The floodwaters and rain surged into Grangemouth, the industrial port town at the Forth Estuary, where the Grange Burn overflowed and flooded people's homes. In response, the government is investing hundreds of millions of pounds into a flood prevention scheme to protect local businesses from similar events in the future. The scientific evidence is irrefutable; you can find details in the Scottish and British Governments' risk assessments on climate change. These so-called extreme weather events are no longer rare but are now annual occurrences that will worsen as the global average temperature continues to rise due to anthropogenic climate change.

This storm occurred five years ago, and there was no power outage that year. However, the storms in 2024 and 2025 caused significant power outages in Polmont, as well as major damage to homes and businesses. Heating and water supplies were lost, and local trees were uprooted due to high winds.

To prevent the canal from overflowing—especially near the railway line—the canal bank has been strengthened in several areas. We still need to enhance the local river network to slow down the water flow from the hills in Polmont. Falkirk District Council has started this work in other parts of the area. Improvements are being made to Polmont's water treatment plant and drainage systems to build resilience in our community against climate change, with a focus on environmentally friendly urban drainage systems. Which will aid biodiversity and water conservation for times of drought (yes, drought in Scotland!)

Kenny, who was once an emergency responder, continually informs the local community that the fire brigade, police, army, Coast Guard, and National Health Service will be overstretched and underfunded in light of our changing weather systems. The first and second sectors of society will not be able to cope with these community challenges. That's why Kenny has stepped up into the third sector as an unpaid volunteer, ensuring that the local community centre is future-proofed for the next generation.

According to Safer Scotland's statutory public rights, our communities require a safe gathering place during emergencies. Events like the extreme weather experienced during the flash flood of 2020 have highlighted the importance of communicating significant hydrological data. This data not only documents the scale of this notable rainfall event but also aims to enhance our understanding of short-duration flood events in Scotland.

The flash flood serves as a reminder of the impact of global warming and changing weather patterns that contributed to the extreme rainfall and flooding that night. It's crucial to record this hydrological data in the context of previous short-duration floods in Scotland. The flooding illustrated the risks to communities worldwide.

From August 7 to August 12, a hot continental air mass dominated the weather over Scotland. During the evening and overnight of Tuesday, August 11, and the morning of Wednesday, August 12, a cluster of thunderstorms formed and moved north across the eastern half of Scotland before dissipating into the North Sea. These thunderstorms brought significant rainfall and lightning, with large accumulations occurring in a short period.

The heavy rainfall from these thunderstorms began across the Lothians and Fife in the late evening of August 11 and progressed northward across Perth and Kinross overnight. While other parts of eastern Scotland remained dry during this time, by early morning on August 12, the thunderstorm activity shifted northeast, delivering intense thundery rainfall to southeast Aberdeenshire. This heavy rain continued for about four to five hours, resulting in notable rainfall totals over relatively short periods.

Rainfall distribution recorded across Scotland during these thunderstorms showed significant values in central and eastern regions, including Fife (106 mm), Clackmannanshire (89 mm), Perth (86 mm), Aberdeenshire (78 mm), and Falkirk (73 mm).

The extreme rainfall recorded on August 11 and 12 led to widespread flash flooding that caused extensive disruption across central and eastern Scotland. The impacts included:

- Flooding in Stonehaven, primarily due to surface water and minor flooding from the Carron River.
- A rail derailment at Carmont near Stonehaven.

- Over 190 properties flooded in Perth & Kinross.
- A breach in the Union Canal near Polmont, leading to damage and closure of the Edinburgh-Glasgow railway line.
- An exposed gas pipe due to erosion along the Black Devon in Clackmannanshire.
- Significant flooding in the Falkirk and Grangemouth areas.
- Major surface water flooding and a declared incident in Fife, affecting locations such as Kirkcaldy hospital and leading to the evacuation of a caravan park due to a landslide.
- A section of the A68 in Midlothian was washed away.

During the period of August 11 and 12, 2020, the Scottish Environment Protection Agency (SEPA) recorded 582 reports of flooding impacts.

For the areas of Falkirk and West Lothian, the sub-daily, daily, and mean monthly rainfall from gauges that recorded the most significant rainfall during August 11 and 12. The Polmonthill gauge recorded the maximum 1-hour rainfall between 04:00 and 05:00 on Wednesday morning, with the highest totals falling in the 2-hour period from 04:00. The maximum 1-hour rainfall at Whitburn occurred at 02:00, with the highest totals recorded between 02:00 and 05:00. Lastly, the maximum 1-hour rainfall at Slamannan was recorded at 03:00, with the peak occurring between 03:00 and 04:00.

Based on the initial rainfall analysis, the area around Linlithgow Bridge (using the Polmonthill rain gauge, which is the closest) experienced about a month's worth of rain in just 5 hours, over a month of rainfall within 12 hours, and more than half of that within just 1 hour. Slamannan recorded approximately half of the mean monthly rainfall in a 3-hour period. Maximum rainfall values recorded from gauges in Falkirk on August 11 and 12, using data from the SEPA rain gauge at Polmont Sewage Treatment Works, indicate an unprecedented level of rainfall never recorded before.