

Freshwater Flood Report

Summary

Freshwater sits in a low-lying bowl bounded by Tennyson Down, Afton Down and Golden Hill. During intense rainfall, runoff from the surrounding high ground drains rapidly into the Western Yar headwaters, with Afton Marsh (North & South) acting as the primary floodplain storage. Flows are then throttled at Blackbridge and further constrained by tidal locking at the Yar Causeway sluice. When heavy rain coincides with high tides—and when channels are silted or choked by vegetation—water backs up across the marshes and overtops into streets and properties, notably along the School Green Road corridor. Wastewater pumping stations surcharge when Norton Transfer is overwhelmed and must do an overflow release, triggering Combined Sewer Overflow (CSO) discharges to the marshes, the Yar and beach outfalls. The former open water “pond” above the causeway has infilled with reed and silt, materially reducing available storm storage. With heavier rains projected and sea levels expected to rise, Freshwater’s ageing drainage and foul networks will face increasing exceedance risk. Development on flood-storage fields would further reduce capacity, while higher tidal levels will shorten the window for sluice discharge at The Causeway.

Key drivers (cause chain):

1. Steep catchment → rapid runoff → drains/ditches/culverts → Yar headwaters.
2. Afton Marsh capacity reduced by reed encroachment & silt; South Marsh grills choke.
3. Blackbridge boards/culverts form a choke.
4. High tide closes Yarmouth Causeway sluice → backwater through Rustic Bridge to Afton Marsh.
5. School Green culvert surcharges: overland flow affects businesses.
6. Pumping stations overflow (CSOs), degrading water quality and amenity.

Impacts: Recurrent business/property flooding; transport disruption (Afton Rd, Avenue Rd); ecological & public health risks (SSSI/SAC/SPA/Ramsar receptors; mosquito nuisance); reputational and economic harm.

Top priorities

- Targeted dredge, desilt & reed management in Afton Marsh to reinstate a low-flow thalweg and storm channel.
- South Marsh, dredge, desilt & reed management, grills: routine litter clearance/brushwood deflectors; improve screen access & safety.

- Blackbridge: Clean and clear culverts; inspect/repair flap valves.
- School Green Rd culvert reach: survey → clearance → root/rubble removal → maintenance plan.
- Serve clearance notices on private culvert reaches and install inspection points.
- 94 Collards Close – could be helped with attenuation ponds at Golden Hill and divert water with ditches and culverts.
- Reinstate/make-good blocked/buried ditches (Longhalves, Parkers Hill, Bannermans Path) with easements.
- Camp/Victoria/Stroud: kerb inlet upgrades, crossfall tweaks, upstream field edge swales.
- Freshwater Bay: ensure marsh levels are kept below carpark drain outlet; check beach/shingle blockage plans.
- CSO transparency: publish live spill status; expedite Inflow and Infiltration reduction and storm storage options.
- Maintain regular street/storm drain clearance.
- Keep ditches clear from Middleton, through Spinfish Lane to School Green Road.

Flood Mechanisms

- **Pluvial (surface water):** Down-slope runoff from Tennyson/Afton/Golden Hill overwhelms drains and ditches.
- **Fluvial (river):** Afton Marsh stores peak flows but storage is compromised by infill; flows throttle at Blackbridge.
- **Tidal:** Yarmouth Causeway sluice closure at high tide causes backwater as far upstream as Afton Marsh.
- **Sewer:** Pumping stations surcharge; CSO spills to marshes and to sea outfalls during storm events.
- **Blockage/maintenance:** Screens, grills, private culvert reaches, and buried/bridged ditches reduce conveyance.

Observed Problem Hotspots (Evidence Log)

Afton Road: Road flooding; access to amenity site/Tesco restricted.

School Green Road cluster: Patch Computers, Pet Store, Carisbrooke Vets, Adrian's

Bike Shop repeatedly flooded; rear culvert silted/vegetated; frontage slot drain dependent on culvert freeboard.

Camp Rd / Victoria Rd / Stroud Rd junction: Recurrent flooding; 02/03/2014 fatal injury incident attributed to flood avoidance.

Avenue Road: Overland flow from Court/Princes/The Avenue → multiple shop floods; CCTV evidence.

Collards Close chain: Overland flow from Golden Hill/Kings Manor; culvert under No. 94 Collards overwhelmed; downstream to Longhalves/Parkers/Bannermans.

Longhalves Lane/Parkers Hill/Bannermans Path: Ditches missing/infilling; private hardstand bridging ditch; need reinstatement and clearance.

Colwell Road/Madeira Lane/Monks Lane: New development runoff overloading legacy drainage; unadopted roads lack drainage; residents installing non-return valves.

Colwell Chine Road: Runoff from common via chine; property sandbagging now common.

Birch Close field: Raised field levels; neighbouring garden/property floods; retaining wall failure under flood load.

Teemill/Rapanui reach: Deep private culvert section heavily overgrown; friction losses slow conveyance.

Blackbridge Road: Downs runoff overwhelms drains; backwater into marsh; if marsh full, Blackbridge floods.

Freshwater Bay: Main road drain under carpark to marsh; fails when marsh levels are high; storm shingle blocks outfalls.

Note: Residents also report ecologic/amenity degradation (fish decline, bat reduction) and increased **mosquito nuisance** linked to prolonged still water and higher marsh levels.

Wastewater & CSO Discharges

Local pumping stations: Bow Bridge, School Green, Coast Guard Lane (to marsh/Yar); Colwell Chine, Madeira Rd, Monks Lane (to sea); Norton (to sea at Yarmouth).

Trend: 2024 spill hours lower than 2023 but >2× 2022. The lower spill hours can be attributed to larger storage capacity from residents installing water butts and larger storage tanks. The storage systems are computerised and now speak to each other.

Indicative capacity: School Green hub believed to pump ~**150 L/s** towards Norton.

Impacts: Contamination of SSSI/SAC/SPA/Ramsar receptors; beach quality and amenity impacts.

Risk Mapping & Sensitivities

- The Camp/Victoria/Stroud junction and Collards Close are routinely impacted despite low mapped annual probabilities (e.g., 1/1000), suggesting **under-represented local mechanisms** (blocked ditches, private culverts, crossfall, inlet capacity).
 - The **Greenway** route through Afton Marsh is frequently impassable due to standing water, risking long-term route viability and safety.
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Recommended Actions

Immediate (0–6 months)

- **Screen & grill regime (South Marsh & Blackbridge):** weekly in wet season; deploy brushwood booms; rapid-response clearance during storms.
- **CCTV & jetting:** School Green Rd culvert; Blackbridge culverts; verify flap valves & joints; remove root ingress.
- **Private reach enforcement:** Serve clearance/improvement notices.
- **Ditch reinstatement:** Longhalves/Parkers/Bannermans; remove hardstand bridging; formalize easements.
- **Ops coordination:** Standing protocol for tide windows at Yarmouth; event comms group (IWC, Island Roads, EA, Southern Water).

Short term (6–18 months)

- **Afton Marsh capacity works:** selective desilt to re-form a **low-flow thalweg** and **storm berm**; retain habitat mosaics.
- **Blackbridge enhancement:** optimize board settings; consider adding a secondary overflow or adjustable orifice to reduce head build-up.
- **Junction retrofits:** Camp/Victoria/Stroud—additional kerb inlets, crossfall/camber corrections, upstream field-edge swales or leaky bunds.
- **Freshwater Bay outfalls:** confirm invert levels; maintain marsh level below outfall; beach/shingle management trigger plan.
- **CSO mitigation plan:** infiltration & inflow (I&I) reduction, targeted storm storage, and smart control; publish live/near-real-time spill data.

Medium term (18–36 months)

- **Upstream natural flood management (NFM):** leaky dams, contour hedges, and temporary storage on Downs where feasible.
 - **Marsh water level management plan:** seasonally adaptive levels balancing ecology, mosquito risk, and flood freeboard.
 - **Greenway resilience:** local boardwalk/raised path segments at persistent wet spots; toe drains to protect adjacent land.
 - **Asset upgrades:** consider enlarging constrained culvert barrels where evidence shows persistent hydraulic deficit. Culvert walls could be made higher.
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Responsibilities & Delivery

- **Lead highway/drainage maintenance:** Island Roads (on behalf of IWC).
 - **Flood risk regulation & main river:** Environment Agency (Yar & sluice interface).
 - **Sewerage undertaker:** Southern Water (pumping stations, CSOs, I&I reduction).
 - **Landowners/occupiers:** Ditch and private culvert maintenance; access provision.
 - **Parish/Community:** Reporting, volunteer reed-rake days, comms.
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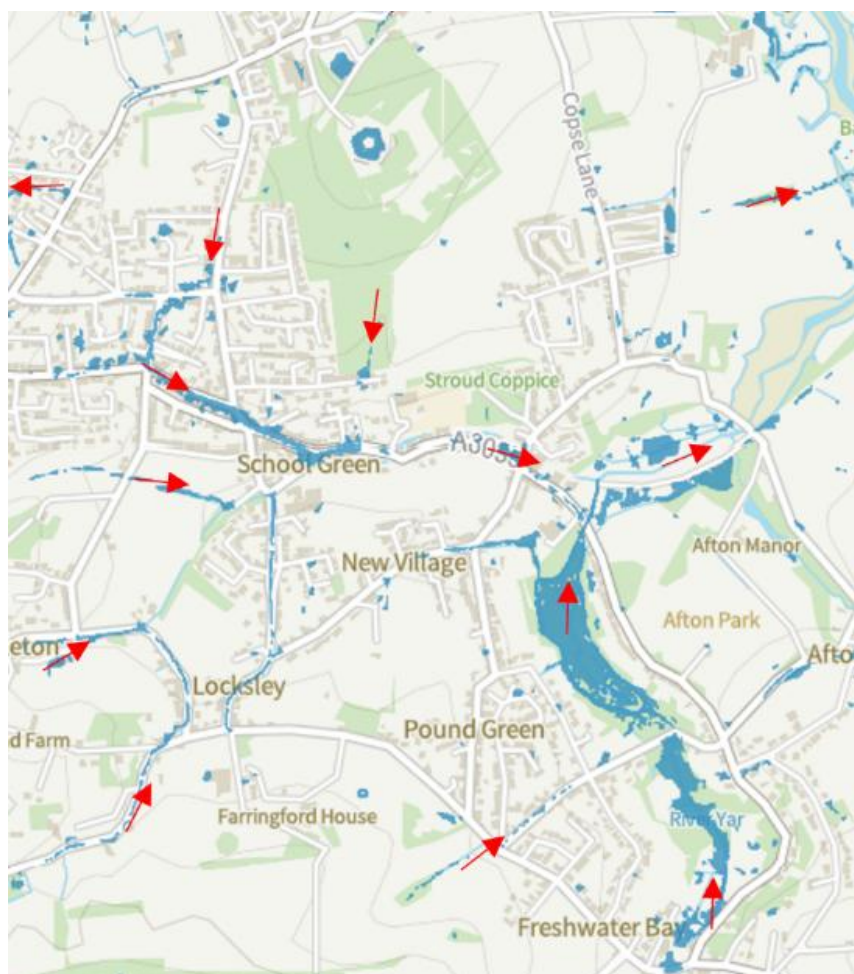
Community Evidence & Health Concerns (Selected)

- **Residents (Afton Rd margins):** fish decline, bat reductions; prolonged impoundment; increased mosquitoes.
- **Medical note:** Historical Yar mosquito (“Yar mosi”) nuisance; future risk from invasive species under warming climate; stagnant water control recommended.
- **Businesses (School Green cluster, Avenue Rd):** repeated internal damages; electrics & stock losses.

Current flooding problems for Freshwater

Water Flow Map for Freshwater/Totland/Colwell Area

The “route” most Freshwater floods take:



1. Freshwater Village is in a dip surrounded by Tennyson downs, Afton downs and Golden Hill Fort. When the rain falls on all the high ground the runoff slopes to freshwater through local drains, ditches, underground rivers and culverts into the Western Yar headwaters.
2. Flow converges through Afton Marsh (South & North Marsh)—this is the river’s natural floodplain and storage area. Paths here are routinely waterlogged in wet spells.
3. Water reaches the constriction at Blackbridge Road (the causeway/boards & culverts). Boards/sluices here have historically been used to manage levels, so this spot becomes a choke point where water can back up south across the marsh and into nearby low-lying streets.
4. Downstream, the river continues north to Yarmouth “Causeway” sluice. But at high tide that sluice closes, blocking discharge and pushing water levels back

upstream—often as far as the Rustic Bridge/Afton Marsh—so if heavy rain coincides with a high tide, levels rise faster around Blackbridge and the marsh. The blockage in this marsh prevents the flood water from being removed from Freshwater Bay.

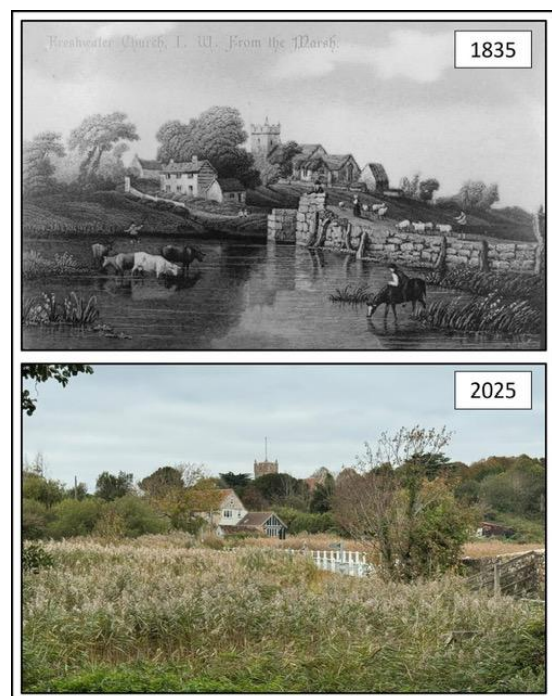
5. The backup also causes the School Green Road culvert to back up preventing water from being taken away from the village itself causing street and property flooding.
6. This problem is exacerbated by the sewage system at Norton Transfer being overwhelmed with high rainfall. It must do an overflow release allowing pumping stations into cause sewage spills into the culvert and marshes.
7. Once the tide drops and the system unclogs.

Early development at Freshwater Gate in the late 19th century encroached on the marshland and constricted the source of the river, requiring more engineered solutions for water flow. The name "Freshwater" comes from the narrow "gate" or gap in the chalk ridge where the sea meets the springhead of the River Yar. The current culvert on School Green Road is a modern incarnation of a much older waterway crossing. Its history is less about the structure itself and more about the ongoing local challenge of managing water flow in a historically marshy area that has been developed over centuries. The effectiveness of the culvert has become a significant modern-day issue for the community, particularly during storms and high tides.

The pictures on the right show Freshwater Causeway in 1835 and today. The open storage capacity of the “pond” area and the waterways have been overtaken by reed beds and silt that have diminished the overall important storm water storage capacity.

The **South Marsh reedbed drains & grills** are easily choked by reed litter.

All of this governs how fast surface water reaches and empties into the Yar and whether Freshwater floods.

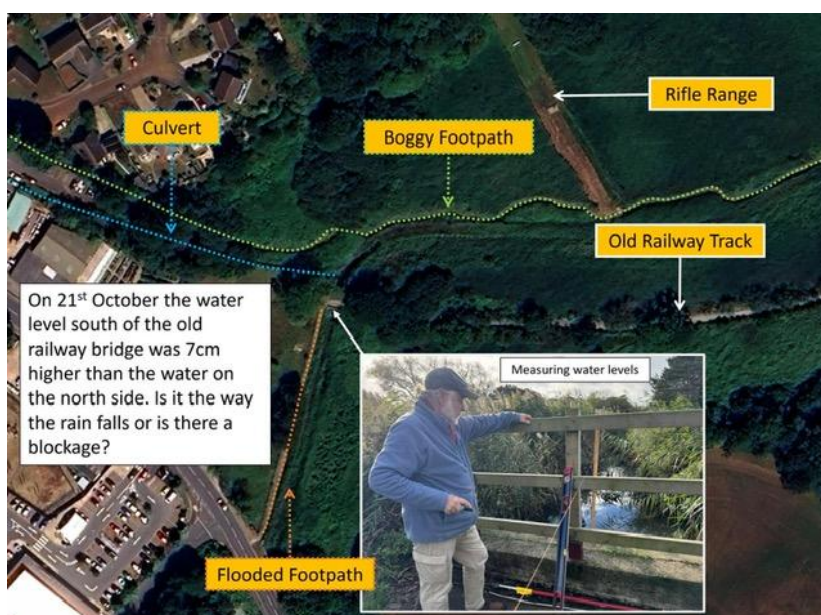


The waterways from Afton Road through the marshes to the Causeway.



The floodwater can't be released until the tide goes out and the Causeway sluice opens. On spring tides or storm surges there can be a very long wait.

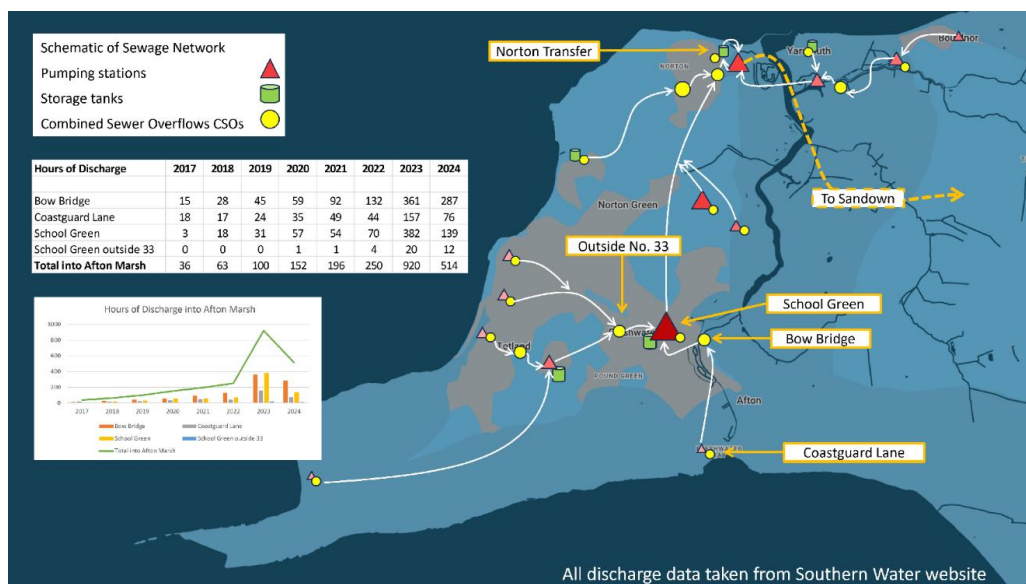
The brown water is often sewage, spilled in periods of heavy rain that has travelled up from Bow Bridge and School Green Road pumping stations.



The water is stuck at a bridge choke point. This point acts as a plug preventing water from draining from the marshes on Afton Road to Blackbridge Road and Freshwater Bay. This bridge needs urgently replacing to allow the water to flow from the marshes and out to the Yar.

Sewage Spills

Sewage spills occur locally at pumping stations at Bow Bridge/School Green/Coast Guard Lane pumping sewage into the culvert at School Green Road, the South Marsh (nationally SSSI protected) and The Yar (SAC, SPA, RAMSAR internationally protected); Colwell Chine/Madeira Rd/Monks Lane pumping stations empty into the sea. Norton pumping station down line of Freshwater pumps into the sea at Yarmouth again SAC, SPA, RAMSAR internationally protected site.



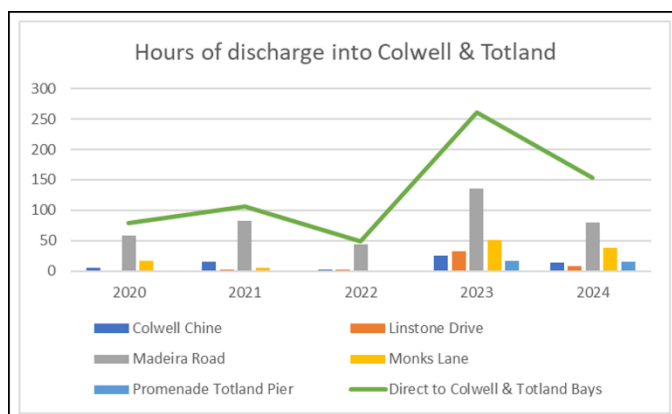
The diagram shows the hours of discharge from the 4 x CSOs that feed into Afton Marsh.

The 2024 drop is due in part to water butts and planters but may be affected by rainfall.

2024 discharges were lower than 2023 but more than double 2022.

We have no indication of the speed at which they discharge so we can't estimate a volume of discharge.

We believe School Green (which is the central hub for Freshwater) pumps towards Norton at 150 litres per second



Hours of Discharge

	2020	2021	2022	2023	2024
Colwell Chine	5	15	2	25	14
Linstone Drive	0	3	3	32	8
Madeira Road	58	83	44	136	79
Monks Lane	16	5	0	51	38
Promenade Totland Pier				17	15
Direct to Colwell & Totland Bays	79	106	49	261	154

Afton Marsh both North and South marshes:

The public footpath / bridleway is to be part of The Greenway running from the Causeway to Freshwater Bay. This is often flooded making the Greenway impassable by bike or foot. The End of the Line Café say that the path to Causeway gets so badly flooded that people must use their land to get passed. The Greenway is at risk if the water levels are not reduced.

<https://www.facebook.com/769798199/videos/400965052528310/>

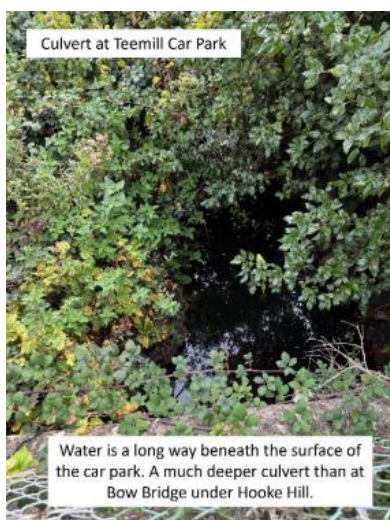
Flooded Paths:



Afton Road

These pictures show the main road that runs between Freshwater to Freshwater Bay.

It crosses the marshes and floods quite regularly, preventing access to the Afton Road civil amenity site, Tesco and to the main middle road route to Newport.



Teemill, to the south of the roundabout, has not suffered with flooding but the culvert is very overgrown with brambles and other vegetation that runs through their car park - at this stage the culvert is very deep, much deeper than when you look from Bowbridge / the bridge beneath Hooke Hill. This will be slowing down the flow in the culvert.

Clearly no-one has cleared that section in several years.



After heavy rains the water flows in from the back of the premises halfway across the floors of the back rooms.

Odds and Sods. Water flows in from the back of the shop halfway across the floors of the back rooms.

This is because there is nowhere for the drains to empty.

Say Care Ltd



As soon as the puddle forms across the road outside Honor & Jeffrey there is nowhere for the drainwater to go and the drain at the bottom of this drainpipe overflows. Simultaneously the toilet becomes unusable without the risk of it backing up. This means the staff have to rely on the toilets at nearby Tesco. The Say Care Ltd building itself is slightly elevated and does not flood.

The Tyre Warehouse



The Tyre Warehouse building itself does not flood but once the drains are full, water spurts out of the manhole in the yard. At this point they are no longer able to use their toilet. In their opinion the situation has deteriorated since Tesco / Co-op was built at a higher level than their premises.

Flooding and Mosquito problems at Afton Road Properties:

Houses at Easter Moy, Cromdale, and Meadowside have problems at Afton Marsh, which backs onto the bottom of their gardens. ie Stream levels rising and Mosquitos! With heavy rain the water levels at the bottom of their garden are much higher, the trees are not maintained because nobody can get to them and worse of all the Mosquito population has increased enormously. Dr Nigel Reid wrote a report on the Yar Mosi many years ago, which was published in a medical journal, about the viciousness of the River Yar mosquito and the health hazard they cause. After WWI the malaria mosquitos had to be dealt with by burning vegetation and dredging the marshes. Today Mosquitoes capable of spreading dengue, chikungunya and Zika viruses have been detected in surveillance traps in the UK and are a **future health** risk in Afton marshes.

<https://ukhsa.blog.gov.uk/2025/05/21/how-we-protect-the-uk-from-vector-borne-diseases/>

Mike & Veronica Reynolds - Easter Moy, Afton Road *"We have over the years witnessed the decline of the population of freshwater fish. When we first moved into our house we could walk all around the marsh as it was surrounded by water. There were plenty of fish living among the reeds and indeed one could actually fish with a rod and line at that time. Over the years the fish population has been decimated solely because of the mismanagement of the water flow and*

the fact that the waterway was never dredged to remove the rotting vegetation accumulating at the bottom as it removed the oxygen needed by the fish to live. One year I believe a large pond liner was installed in the middle of the marsh to attract birds and insects. This has resulted in flooding at the bottom of our garden every winter since then with the public footpath constantly under water. The flood gates at the end of the causeway could in theory be opened on a regular basis to control the level of water but no one seems to consider this necessary. Mosquitoes were rarely a problem. However, about two years ago the decision was made to deliberately flood the marsh on our side. At least that was the reason given when I queried what was going on with the management of the environment. Since then, we have been plagued with mosquitoes as a result of the still water left in situ. They are still about, and you cannot go into the garden without coming across them. In France there is a problem with tiger mosquitoes, which have spread rapidly from the south to the north, and I believe have made their way to the U.K. This species can be a vector for several diseases including dengue, Zika, and chikungunya. Does anyone monitor whether this species is here in Freshwater yet? This year we have seen a noticeable decline in the number of bats seen in the evenings.”

Angela Biles” I live on Afton rd., and the flooding issues are ridiculous, two houses down from us is a badger set on the river’s edge, so it would be awful if they were flooded out. I raised the point that years ago the rivers were dredged regularly and said it’s so obvious if this doesn’t happen the height of water will just continue to rise!! A small amount of rain now and the path is not able to be accessed; behind us the path has vanished and not been able to be walked for at least 2 years”.

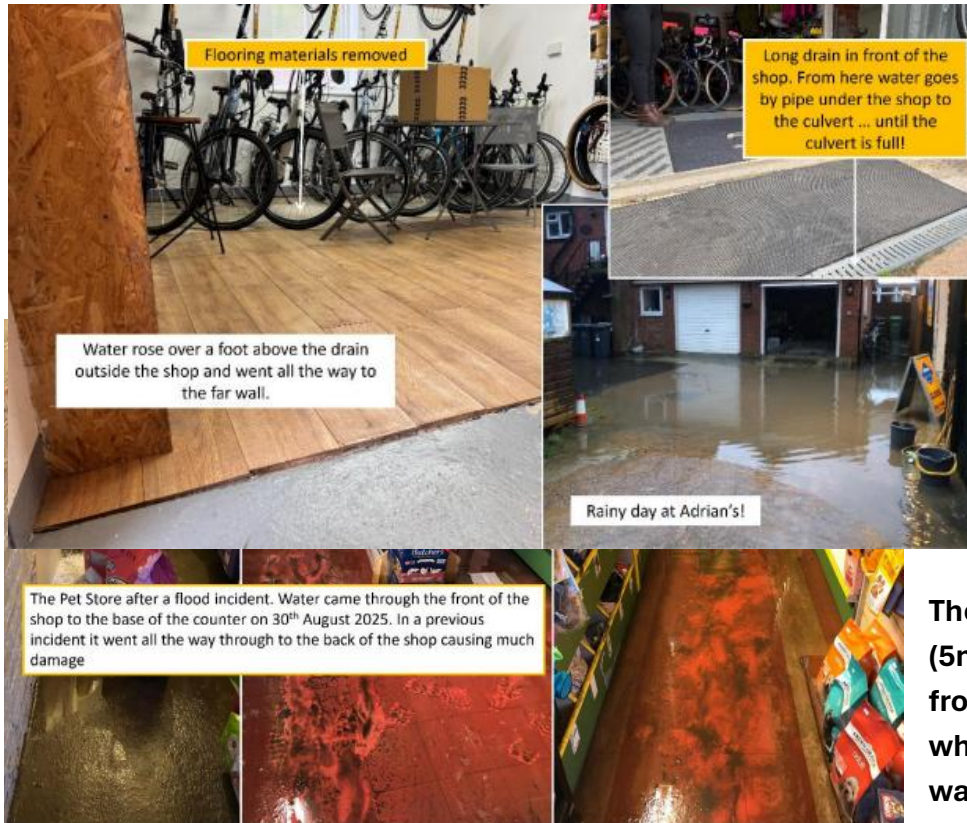
School Green Road

The businesses at the bottom end of School Green Road, close to the roundabout, are suffering worst. They have a culvert running behind their property that is silted up and clogged in several places with vegetation.

Patch Computers, The Pet Store, Carisbrooke Vets and Adrian’s Bike Shop were all flooded on 30th August 2025 and speak of previous flood occasions.



At the Pet Store (Mark Mocroft) water flowed in from the roadside of the building and came in as far as the bottom of the counter. Fortunately, Mark was around and managed to lift perishable stock out of harm's way. In a previous flood incident, the water was deeper, going (higher) into the back of the shop and, because Mark was not around to save it, stock was damaged. Mark has supplied various photos.



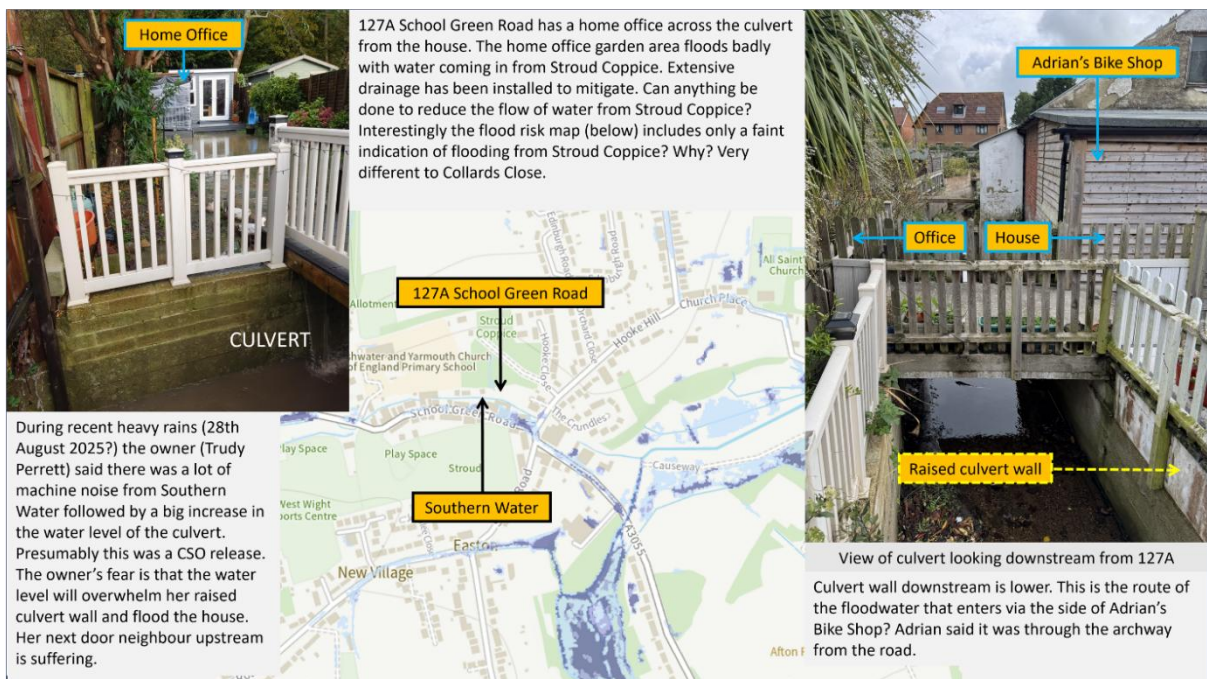
On Left:
Adrian's Bike Shop floods with water running through the archway from the road and accumulating in front of the bike shop.

There is a long (5metres) drain in front of the shop which takes the water to a pipe going beneath the premises and thence to the culvert at the back. When the culvert is full, there is nowhere for the floodwater to go to other than into the shop.



On Right: Patch Computers has been flooded, with water coming into the premises, damaging stock on the floor and blowing the electrics. The external photo from their CCTV system illustrates the situation.





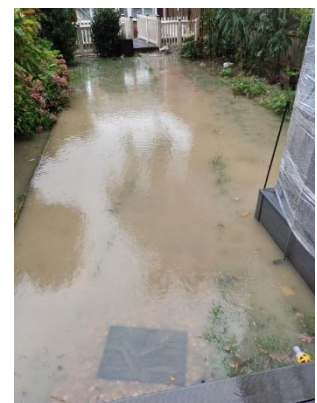
Left :127A School Green Road back garden

The flooding from Stroud Coppice has only started happening when the properties were built on Hooke Close.

Several houses are now affected.

The owner has had to raise her garden and put in land drains to try and solve the problem.

A solution is to build a retention pond on the land above the coppice with maybe a bank at the bottom of the coppice to divert the water into the culvert further down.



The Vine Inn has suffered flooding several years running.



The water rushes down the Avenue and meets water from



Queens Road and Tennyson Road just outside the pub.

The pub becomes flooded.



This flood water then travels down to School Green Road and meets water coming down from Longhalves Lane, Dall Square, Parkers Hill and Bannermans Path.

Right: Outside Library on School Green Road

There are reports from locals of the culvert at Hooke Hill being blocked. This could be at Bow Bridge or behind Rapanui. (See pictures later of the overgrown vegetation in culvert at Rapanui)

This block has prevented the ducks from travelling up the culvert and will prevent the storm water travelling unheeded down to the Causeway.

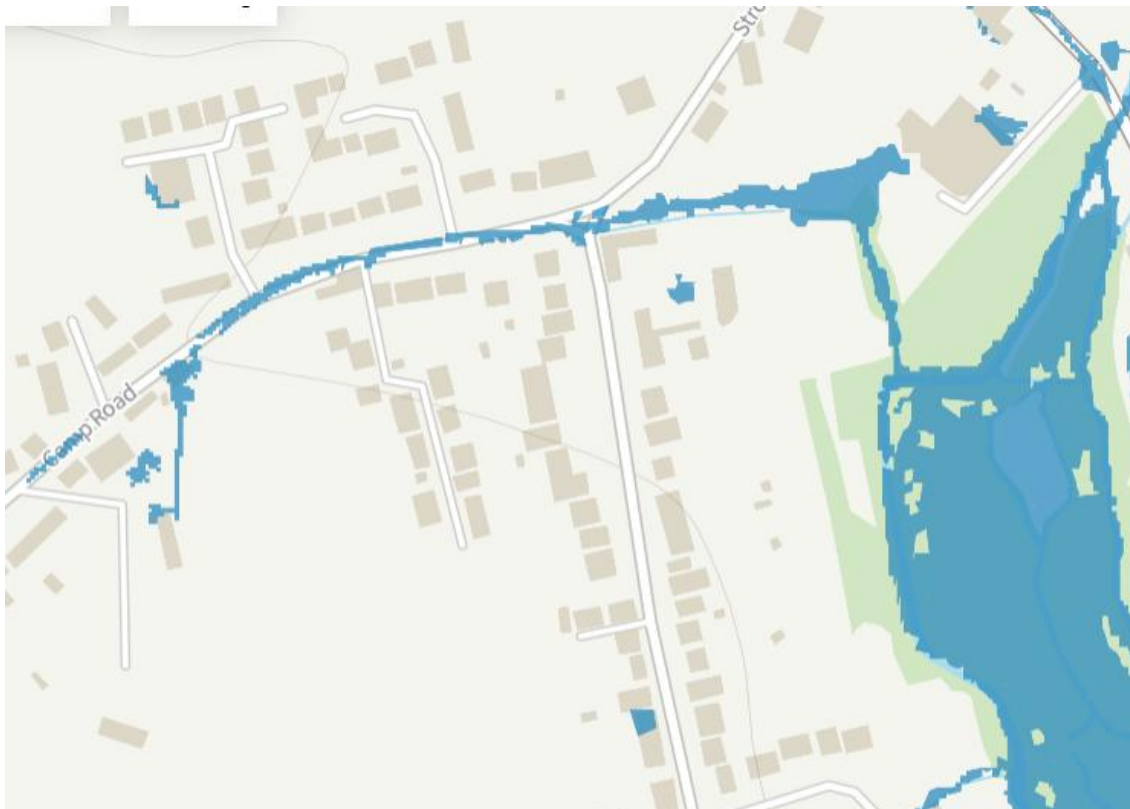
Camp Road



These pictures show flooding at junction of Camp Road, Victoria Road and Stroud Road. This is a regular flooding occurrence.

This was the site of an accident on 02/03/2014 where an elderly man was knocked over on the junction of Victoria Road/Camp Road to

avoid the flood. He suffered dramatic life changing injuries, with numerous breaks, and later died of his injuries.



This Flood map below shows 1/1000 annual risk of flooding, yet this is a normal occurrence along this junction.

<https://www.facebook.com/100003184189900/videos/pcb.887473439187108/703849374820974>



Left: Flooding from field onto Camp Road



Left: Mole Cottage, Camp Road

The owner said, "We already experience flooding from field run off water from the field and can be deep enough to flood into our property."

<https://www.facebook.com/1160043495/videos/pcb.1061221541812296/789727823007277>

Victoria Road

Donnington, a house along Victoria Road is not shown as a risk on this map but the owner was severely flooded when a tree was removed from the Camp Road field above.

The Donnington owner said "There was a huge tree as can be seen on Google maps on the left of the gate. The family cut this tree down and subsequently my house has been flooded, and the internal walls have become damp. There is an underground stream that feeds the wells of the three houses to the right of the alleyway and then runs below ground to feed the Marshland and on to the Causeway and Yar river. I am so worried that more flooding will occur if this proposed development goes ahead. Floodwater that would otherwise be soaked up by green field instead will run off quickly off concrete/building and cause me more flooding" "I am very concerned that the pollutants from these proposed houses will damage our natural underground springs that run under my property down to the Marshes and The Yar River."

Mrs Gerrie Lambert owner of Langholme *"I own the land alongside the river and ever since the building of the foot path through the marsh my land has become unusable by a third due to the now higher water table. Even through this hot weather it is still under water. Mrs Lambert keeps ponies but must limit them to just 1/3 of the field nearest her property as the ground is too waterlogged for the ponies to use safely.*

Avenue Road

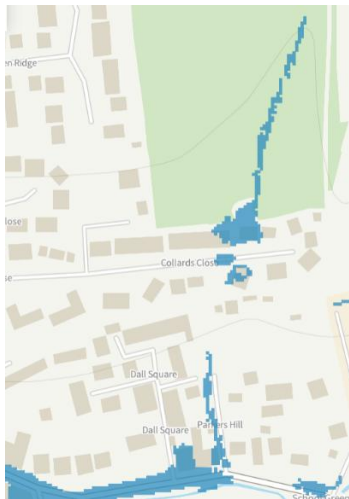


Avenue Road has flood water from Court Road, Princes Road and The Avenue. The drainage system can't cope in high rainfall and the whole road floods, and several shops have been affected with internal flooding.

These pictures show CCTV footage of Avenue Road and several shops were flooded. The pictures show internal flooding of the Dentists surgery.



Collards Close



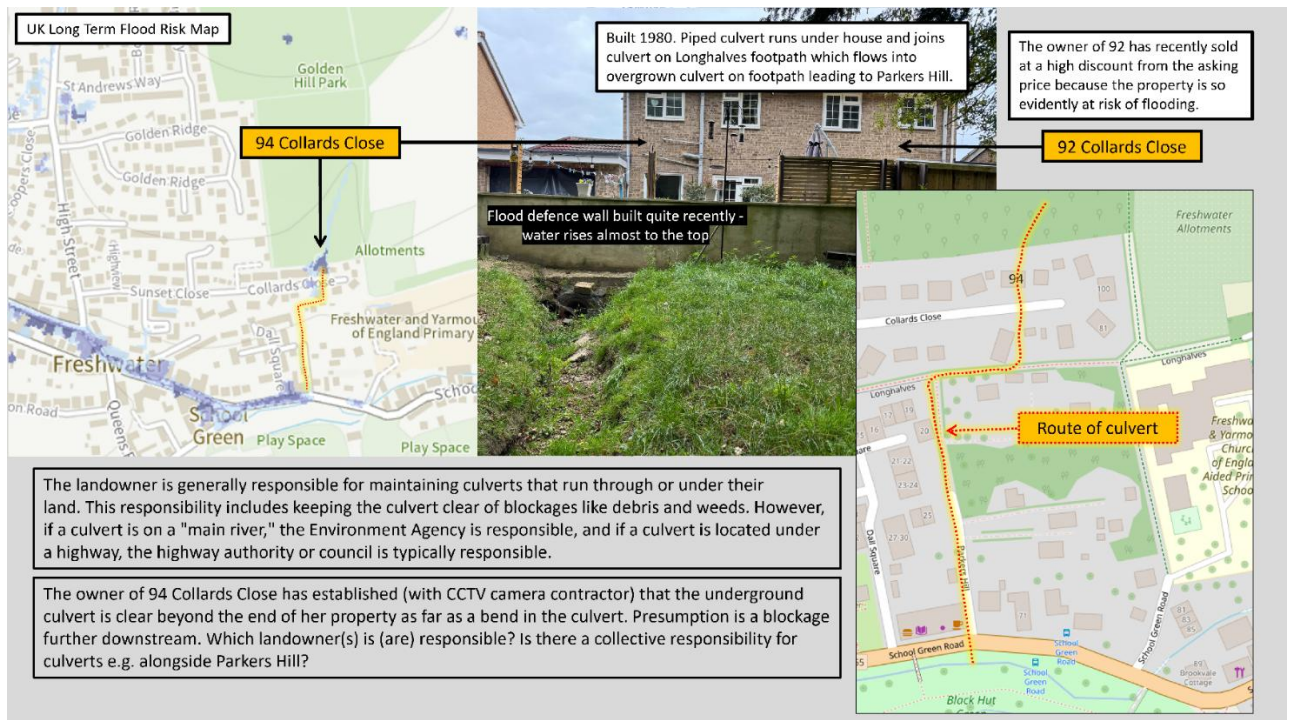
This Flood map shows 1/1000 annual risk of flooding, yet this is a normal occurrence.



Pictures showing the back garden where the culvert, that is under the house, is overwhelmed with the sheer amount of runoff water from Golden Hill Fort and Kings Manor land. The flood water comes through Christmas Tree wood on to the land at the back of the property.



This is the area where the pipe comes from Kings Manor Land, under the path, onto the land of Christmas Tree Wood. It joins the water coming down from Golden Hill Fort and travels down to the culvert under the house of 94 Collards Close.



The flood water travels through and round the property, into Collards Close and down to Longhalves Lane/Parkers Hill/Dall Square/ Bannermans Path.

Longhalves Lane/Parkers Hill / Bannermans Path:



The paths are all overwhelmed with the sheer volume of flood water. Ditches need to be added; other ditches need clearing and digging out. Someone has built over a ditch with a car hard standing area - restricting the flow leading to the culvert.

Colwell Road/ Maderia Lane

The water runs off the field in Birch Close and the new Meadow Way development. Houses and garages lower down with sloping driveways are now overwhelmed with flood water. Water from this area doesn't flow into Freshwater basin other than through the Southern Water network. New developments have overwhelmed this old drainage network. Maderia lane hasn't any drainage as it is unadopted road, so it relies on culverts and ditches. Some ditches have been filled in leaving houses and gardens at risk and residents have had to fit Anti Flood devices (Non return valve) to protect their homes.

Photos show local properties trying to prevent flooding and flooded gardens/roads



Colwell chine Road



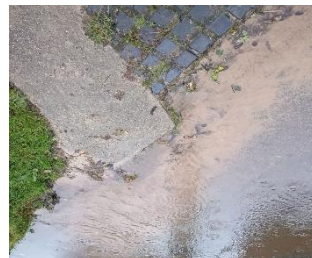
Water runs down from the common through the chine. Houses can now be seen with sandbags; owners trying desperately to prevent flooding to their properties.

Birch Close



The field behind Birch Close is higher than the surrounding land. The field levels were altered with development and since then the neighbouring gardens and property have been flooded. The weight of the flood water coming off the field destroyed a garden retaining wall.

Blackbridge Road



Floodwater comes off Tennyson Downs and along down Blackbridge Road. Overwhelming drains and enters the marsh. If the marsh is full, it causes flooding at the Blackbridge.

Freshwater Bay



Future Flood Risk: Freshwater & Western Yar

Freshwater faces compound flood risk from the Western Yar (fluvial), tidal/storm-surge interactions at the estuary, and intense rainfall generating surface-water runoff. Channel pinch-points and constrained floodplains make the system prone to short-notice (flash) flooding. Climate change will increase peak river flows, storm intensity, and tidal levels, raising the baseline risk for existing residents and any new development. Unless development avoids functional floodplain and strictly limits runoff, it will increase exposure for current and future generations.

Key flood mechanisms

- **Fluvial (river) flooding:** The Western Yar drains through Freshwater; sections of the channel are constrained, causing rapid out-of-bank flows when rainfall is intense or prolonged. High tides can “back-up” the system, slowing discharge.
- **Tidal & storm surge:** Astronomical tides at Yarmouth/Freshwater Bay are frequently modulated by low pressure and onshore winds. Positive surges elevate water levels above predicted tide tables; coincident surges with high spring tides and river peaks pose the greatest hazard.
- **Surface-water (pluvial) flooding:** Heavy downpours exceed drainage capacity, with runoff concentrating on streets and across fields—particularly where soils are saturated or sealed by hardstanding.
- **System interactions:** High tide + surge can reduce fluvial conveyance, while simultaneous intense rainfall and saturated ground create compound events with limited warning.

Development boundary changes (grey = current hardened edge; yellow = to show proposed development boundary areas which are not hardened and include all adjacent fields)



- Proposed extensions include non-hardened, greenfield parcels adjacent to the current settlement edge.
- **Risk implication:** Building on fields that presently store, and infiltrate water will increase peak runoff and reduce floodplain storage. Without robust constraints, this will elevate flood levels and velocities downstream, including in established residential streets.

Development impacts

- Roofs, roads, and drives generate fast runoff that overwhelms culverts and highway drains.
- In floodplains, platforms, fencing, and boundary walls obstruct overland flow, increasing depth and hazard elsewhere.
- Poorly maintained drainage (silted ditches, blocked culverts, stuck tide-flaps) exacerbates all of the above.

Climate change & sea-level rise

- **Tides and storm surge:** While astronomical tides are predictable, weather often adds a residual that can raise or lower observed levels; during deep lows and strong onshore winds this becomes a **storm surge**, the main driver of coastal flood extremes. Over centuries, global sea level is rising due to ocean warming and land-ice loss, and in the UK the land is still adjusting to the last ice age—Scotland uplifting and southern England subsiding—so **relative sea-level rise is greatest in the south**. The latest assessments indicate around **0.2–0.4 m** rise by **2050** and roughly **0.5–1.1 m** by **2100** for southern England, depending on emissions, with higher outcomes possible under low-confidence ice-sheet responses. Local planning should therefore combine tide-table heights with site-specific UKCP18 sea-level projections and **storm-surge allowances**.
- Contemporary projections show **accelerating** rise and higher extremes through the 21st century.

Mapping

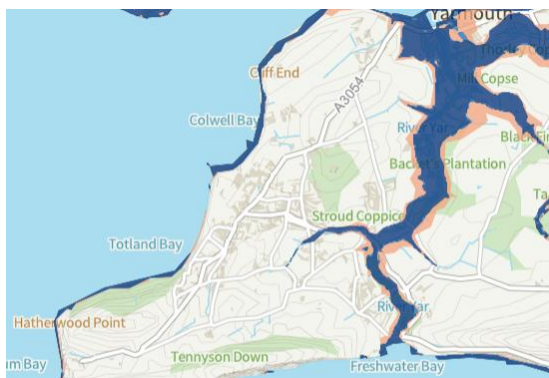


Figure A: Flood Zones 2 & 3 (fluvial) — predicted extents.

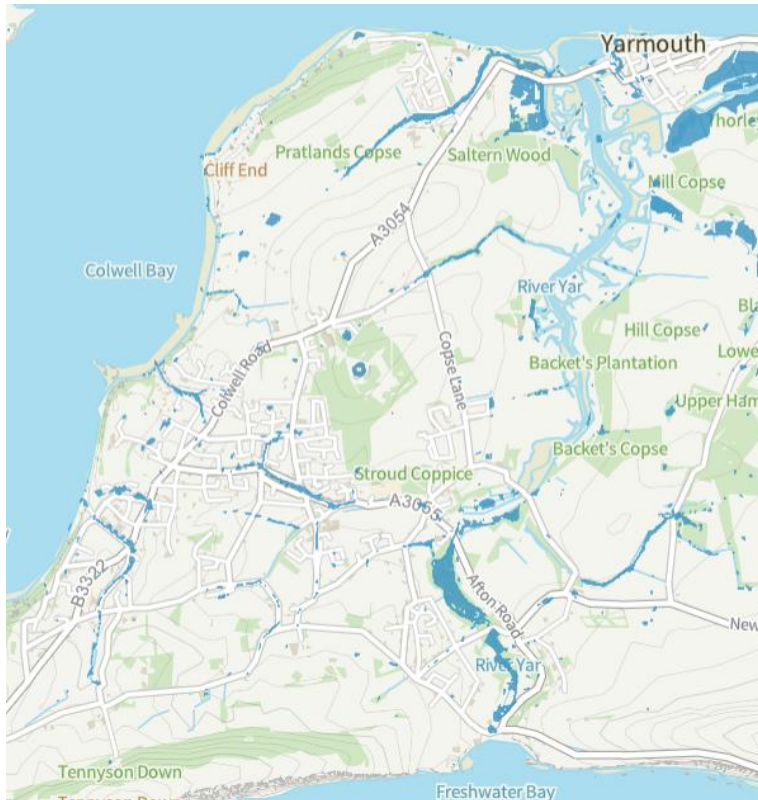


Figure B: Surface-water flood mapping predicted extents



Figure C: flow paths and storage areas.

Local assets and infrastructure at risk

Residential streets effected: School Green Rd, The Avenue, Victoria Rd, Camp Rd, Collards Close, Afton Rd, Brookside Road, Spinfish Lane to Middleton, Parkers Hill, Coastguard Lane and Freshwater Bay.

Business areas: The Avenue, School Green Rd, Afton Rd.

Community & heritage: Freshwater Bay Conservation Area; Freshwater & Yarmouth School.

Critical links:

- A3055 Causeway (Afton Manor → School Green)
- Blackbridge (Afton Marsh)
- Freshwater Bay routes to the A3055/Military Rd
- A3054 (Halletts Shute → Western Yar Bridge)

Key sites: Freshwater Bay car park; Lifeboat Station; Afton Road Civic Amenity Site; Afton Marsh LNR; beaches (Freshwater Bay, Fort Victoria).

Utilities: potable water mains; foul sewers and pumping stations (Bow Bridge/School Green/Coast Guard Lane; Colwell Chine/Madeira Rd/Monks Lane); electricity substations/boosters; gas main along the disused railway—at risk from coastal/tidal inundation.

Environmental designations

- **International:** SAC, SPA, Ramsar (part of the Solent complex) — Sites identified for the protection of internationally important wetlands and wildfowl habitats.
- **National:** SSSIs (Yar Estuary; Freshwater Marshes). These sites are designated by Natural England under the Wildlife & Countryside Acts as the best examples of the UK's flora, fauna, geological features or landforms. The aim of the site is to maintain the present diversity of animals and plants. For biological sites the designation is based on an established set of criteria that include naturalness, diversity, size, fragility and rarity.
- **Local:** Afton Marsh **Local Nature Reserve**; locally designated **SINCs**. Afton Marsh Local Nature Reserve Local Nature Reserves (LNRs) are for both people and wildlife. They are places with wildlife or geological features that are of special interest locally, which give people special opportunities to study and learn about them or simply enjoy and have contact with nature. Sites of Importance for Nature Conservation (SINCs) are non-statutory local sites designated for conservation, maintenance and enhancement of species and habitats of local nature conservation value in the area.

Water-level control & outfalls (operate & maintain)

- **Freshwater Causeway Bridge:** double tide-flaps under the north wall.
- Additional sluices, boards, culverts, and flap valves across Afton Marsh and the Causeway reach.
- **O&M priorities:** routine silt removal; vegetation management; flap inspection (free-swinging, not jammed); trash-screen clearance ahead of storms.

Planning & design policy

1. Location & avoidance

- No highly vulnerable development in **Flood Zone 3b**.
- Safeguard existing **flood storage** and **overland flow routes**; prohibit infilling/raising that reduces storage without like-for-like compensation on site.

2. Runoff control (SuDS-first)

- Provide **exceedance routing** (safe overland paths) back to open space, not into homes/roads.

3. Bridges, culverts, and riparian duties

- No culvert narrowing; maintain or increase conveyance.
- Condition **maintenance plans** (named responsible party, inspection frequency, pre-storm checks).
- Protect and, where possible, **restore floodplain connectivity**.

4. Construction & operation

- **Construction Environmental Management Plan (CEMP)** with pollution prevention, sediment controls, and timing to protect designated sites.
- Developer contributions for **long-term SuDS adoption/maintenance** (private management company or authority/adopting body).

5. Emergency planning

- Site-specific **Flood Warning & Evacuation Plans**; registration with EA Flood Warning Service where available.
- Trigger **Section 19** investigations after significant events to capture learning and assign actions.

Immediate operational focus (pre-storm readiness)

- **Asset checks 24–48 h pre-event:** clear trash screens; verify tide-flaps swing/seat correctly; inspect known pinch-points at culverts and the Causeway.
 - **Pre-emptive drawdown (where controllable):** lower upstream storage in Afton Marsh/ditches **6–12 h** before a forecast red-zone tide **when heavy rain is also forecast** - exact mAOD (meters above ordnance datum) or trigger and board settings to be defined per asset once surveyed).
 - **Community comms:** local alerts to residents on School Green Rd/Victoria Rd/Camp Rd/Afton Rd; pre-position barriers and pumps for known low spots.
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