

“Climate change will increase the intensity of rainy periods, as we experienced on 6 October 2014 in Grabels. We therefore urgently need to adapt to these events and protect the entire population”

René Revol,  
Mayor of Grabels

.../... Grabels already had a **flood retention basin** in 2014 (Basin G on the Rieumassel) and two storm water basins (one at the Rieumassel/Redonnel confluence and another at the Carignans housing estate) but in 2022 and 2023 the municipality will undertake **major works** on the Rieumassel. The project will be managed by **Montpellier Méditerranée Métropole (3M)**, or Greater Montpellier Council) as part of the floods, rivers and wetlands management plan (GEMAPI). They also feature in an amendment to the PAPI2 (2015–2020) flood action programme administered by the Lez River Basin Association (SYBLE or EPTB Lez).

The works involve:

- **Dismantling** the current **Basin G** and rescaling it to fit the new one-hundred year flood event (raising the flood bank by 2 metres and enlarging the basin from 26,000 m<sup>3</sup> to 160,000 m<sup>3</sup>).
- **Widening** the stream bed in 5 areas.
- **Widening** the Rue Croix de Guillery bridge near the Jean Ponsy School (Les Bugadières) from 5 to 10 metres.
- The RD 127 bridge (Route de Montpellier) will also be subsequently widened.

The goal of these works is to ensure the stream bed of the Rieumassel is big enough to cope with the new one-hundred year flood level in all places as it crosses built-up areas of Grabels.

Basin G, called Arbre Blanc, will be dismantled and rescaled to the 2014 flood (one-hundred year flood).



2014 flood level marker at Bugadières.

3M has also provided support to Grabels, including **emergency works** to Basin G, incorporating the new flood and runoff risks in the local plan by new flood risk zones and new stormwater and sewerage provisions, more frequent riverbed maintenance, particularly on the Rieumassel and finally, assisting crisis management (installation of a sensor at Basin G, updating the PCS, etc.).

The **Lez river basin association (SYBLE)** has organised an extensive campaign to install **flood level markers** throughout the Lez river catchment as part of the PAPII flood action programme (2007–2014), including several in Grabels. Three additional flood level markers from 2014 have also been installed in Grabels as part of the PAPI2 flood action programme (2015–2020).

The **Lez river basin association** has also introduced a survey initiative to assess **flood vulnerability** as well as free family flood safety plans (entitled, Lez'Alabri) for local people. 100 of these have been produced for Grabels. Since 2018 eligible residents can secure public grants (State and Departmental) to cover at least 80% of the cost of building work to protect their homes from flooding. 30 such applications are currently being assessed.

Finally, **local people** also decided to take action after the floods and formed several associations. Currently, the “**Tous au SEC (Sinistrés En Colère)**”, formed in November 2014 after gathering 450 signatures from dissatisfied local residents, is now seeking to initiate a step-change in the legalities of preventive measures. It believes that environmental law must now take precedence over urban planning law. Tous au SEC is also involved in the works by the municipality on the PAPI flood action programme and is a member of the Citizens' Council for Ecological Transition.

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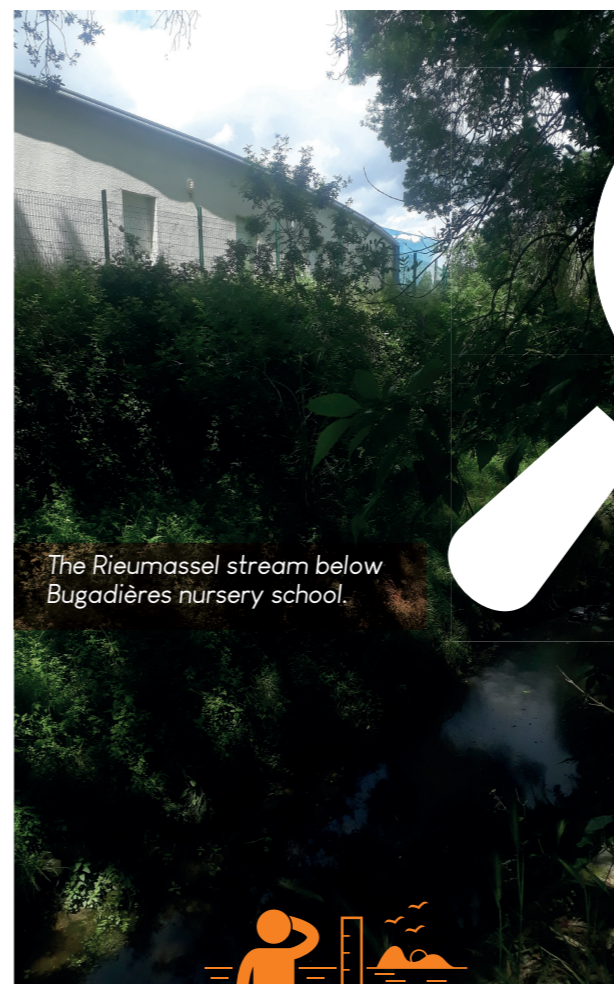
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The Rieumassel stream below Bugadières nursery school.



Grabels 2014  
Le Rieumassel

## Grabels, Mosson and Rieumassel

**Situation** : The town of Grabels, in the Hérault Department (34), has a population of 8,603 (2018 census). Like many towns on the outskirts of Montpellier, it has grown enormously over the last few decades (from 1,020 residents in 1968). The town expanded from its old village centre below a hill and is bordered to the north-west and south-east by the River Mosson. The Mosson flows through the western part of Greater Montpellier then joins both the River Lez and the Étang de l'Arnel lagoon at Villeneuve-lès-Maguelone. In Grabels, the Mosson is firstly joined on its right bank by a stream called La Soucarède then the Rieumassel on its left.

## Past floods and today's regions in the Mediterranean Arc

The source of the Rieumassel is at Valmaillargues, 1.5 km north-east of Grabels. This little stream is highly irregular and only flows when there is heavy rainfall. It runs from north to south across the eastern part of the Grabels and is also joined by its main tributary, the Redonnel.

Housing estates have been built along its course, some of which are single-storey, like the Rio neighbourhood (named after a small tributary of the Rieumassel) and social housing such as in the town's Bugadières district. The Rieumassel then joins the Mosson River at “La Grave” before the river rushes into some gorges to then reappear at Juvignac, near La Paillade. This section of the river is a bottleneck and water levels rise at the confluence during peak flow.

Three bridges across the Rieumassel also form additional obstacles to the flow of water (the RD 127 bridge crossing, the bridge on the Rue Croix de Guillery and one at the confluence with the Mosson River).



A housing estate on the banks of the Rieumassel. Photo credit: EPTB Lez

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## 6 to 7 October 2014, The raging Rieumassel!

There were many **periods of heavy rainfall** throughout the **Mediterranean Arc** in 2014. The Var, Alpes-Maritimes, Gard, **Hérault**, Aude and the Pyrénées-Orientales Depart-ments were in the firing line, one after the other, from January to the autumn. In **Grabels**, people had to be **evacuated by helicopter** from the Moulin de la Grave (at the confluence of the Mosson and Rieumassel) during one deluge on **29 to 30 September**. The next storm that hit Grabels during the night of **6 to 7 October** was **even worse**, with the heaviest rain falling on the **Rieumassel** catchment and its main tributary, the **Redonnel**. Around Grabels and Juvignac, accumulated rainfall reached **292 mm in 6 hours** (from 7.45 pm to 2 am) peaking at **140 mm in one hour**.

Cars piled up in the Rio housing estate.  
Photo credit: Richard Hawkins for Montpellier Méditerranée Métropole.



In 2010, Grabels had a 26,000 m<sup>3</sup> **flood retention basin** built (Basin G, called Arbre Blanc) upstream of the residential areas. Despite this, the Rieumassel **quickly filled the basin, spilled over the floodbank** and joined **runoff waters** (50 cm deep in places) rushing downhill from the old town to **suddenly flood the Soleil, Rio and Bugadières** districts in the **middle of the night**. The **Soucarède** River also flooded and caused huge damage to homes in the **Bel-Air neighbourhood**. By contrast, the **Mosson** River was **much less affected** except in the Moulin de la Grave district.

While Grabels had a local **emergency action plan (PCS)** and a **privately-run early-warning support system** that both worked as planned, the town wasn't prepared for the extreme ferocity and **speed of the floodwaters**.

Furthermore, when the water **breached some high stone walls**, it **flushed** through the ground floors of various houses. The water was up to **2 m** deep in places.

### The toll from the floods was heavy but fortunately, there were no casualties:

- **574 homes were affected**, including just over **200 where living rooms, bedrooms, etc.** were flooded necessitating some 60 families to move into emergency housing.
- **31 people air-lifted.**
- **223 vehicles written-off.**
- **Extensive damage to municipal buildings** (subsidised grocery store, the Gutenberg community centre) or minor damage.
- **Significant damage to roads**, especially the nursery school bridge.
- Damage to public amenities and roads amounted to over **1 million euros**.



### Historic floods:

The story of the village of Grabels has been frequently marked by flooding, essentially by the Mosson River. The benchmark (or basic-stage) flood for the Mosson dates back to **26 and 27 September 1933** when it flooded the Château stables and virtually reached **the roofs in the Moulin de la Grave** neighbourhood. The flood on **1 December 1971** and especially that of **23 September 1976** which reached the château and engulfed **the Moulin de la Grave with 1.75 of water**, is still remembered by some older residents.

By contrast, **no human recollections or newspaper reports match a flood of the Rieumassel** on the scale of that which occurred on **6 to 7 October 2014**.

It **outripped all the models** used for the 2001 PPRi and was deemed **'exceptional'** as it greatly exceeded the estimated one-hundred year flood event at the time.



Some flood level markers in Grabels in the Moulin de la Grave district prior to demolition in 2016. The highest flood marker refers to that of 1933. The lower ones record the floods of September 1976 and December 2002.  
Photo credit: Cathy Vignon/Mosson Coulée Verte.



Rue du Picadou in the Bugadières neighbourhood, on 7 October 2014  
Photo credit: Cathy Vignon/Mosson Coulée Verte.  
Note the flood debris lines on the garage door then (left) and the scene today (right).

### GRABELS

A resident in the Rieumassel housing estate stated:

« Suddenly the road filled with water and spilled over the kerbs. There was no doubt, so we decided to go down to the garage to lift everything up out of harm's way. When we opened the door to the garage stairs, we saw a **brown wave of water surge** under the garage door and before you could even utter a word, it hit the utility room wall sweeping away everything in its path, even large, heavy drums of unused wall render! »

One resident from the Plein Soleil Close said:

« The water rose, the door splintered into pieces and it flowed into the house. With no electricity and in the pitch dark, all four of us climbed onto the bed next to my son.

Over the next 20 minutes, the water carried on rising to 1.6 m deep reaching the middle of the mattress before it finally stopped.

We heard a helicopter above the house and a firefighter asked us if we wanted to be air-lifted but we saw that the water was starting to recede so we told him no and that we would be ok. »



## Key players and post-flood management measures:

After the disaster, several bodies were in-volved in addressing this new situation concerning the Rieumassel.

The flood greatly exceeded the PPRi benchmark level of 2001 so the French government is currently **reviewing and redefining** the occurrence of the previous flood level which has been upgraded from a one-hundred year to a thirty-year flood event. The **2014 flood, defined as the "new" one-hundred year flood event** will subsequently become the **benchmark (or basic-stage) flood** for the Rieumassel. This **amendment** has been disclosed to the municipality. Meanwhile the benchmark flood level for the Mosson River remains that of 1933.

Furthermore, **two residential areas** have been **relocated**. These are the Moulin de la Grave (where the Mosson meets the Rieumassel) and some homes on the left bank of the Soucarède River.

Grabels, which spent 1 million euros on repairs and clean-up operations to roads and public buildings, already had a DICRIM in 2014 (Municipal Information Document on Major Risks) and a PCS (local emergency action plan) together with a privately-run early-warning support system. The system sends SMS to local residents. The PCS is regularly updated and supported by a team of **80 rapid-response public safety volunteers**.

Plein Soleil Close then (left) and now (right).  
Photo credit: EPTB Lez.

