Chapter 10
Two Floods Compared: Perception of and Response to the 1682 and 1715 Flooding Disasters in the Low Countries

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Abstract On 26 January 1682 and again on 3 March 1715, parts of the coastal lowlands of the Netherlands in the southwest were flooded. Both flooding disasters were caused by a storm surge, and in both cases, largely the same areas were flooded. Because these events occurred within a time interval of 33 years, documentary evidence of the 1715 flooding makes numerous references to the 1682 flooding. It not only allows us to learn about the causes and extent of both flooding disasters, but also enables us to study what the contemporaries of 1715 had actually learnt from the 1682 disaster. In particular, we look at how the measures taken after the first flood and those taken in 1715 differed. Furthermore, we need to have an insight into the perception of both flooding events: Had the perception in 1715 really changed? Moreover, is there a difference in the perception of people if we make a distinction into different social classes? Or is perception based on different people just having different kinds of responsibilities? And what about people who were mere victims of these flooding events?

Keywords Flooding • Storm surges • Weather extremes • Perception • Low Countries • Dike building and maintenance

10.1 Introduction

The coastal lowlands of the Low Countries are characterised by a long-standing record of flooding events. The oldest recorded flooding dates back to 838 (Gottschalk 1971, p. 34) and the most recent flood in the Netherlands took place in 1953, whilst in Belgium there was a flood near Antwerp in 1976. The sixteenth

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K. Pfeifer and N. Pfeifer (eds.), *Forces of Nature and Cultural Responses*,
DOI 10.1007/978-94-007-5000-5_10,

century stands out as the century with the highest number of flooding events. It was common practice for these disasters to be mentioned in chronicles, but more relevant are the numerous administrative documents on the causes, scales and measures taken to re-embank lands hit by flooding. Whilst the sixteenth-century flooding events have been studied thoroughly, the seventeenth century seems to be a quieter period until all of a sudden in 1682 a disastrous flood occurred and again, 33 years later, a second flood hit the same area. This makes these two flooding events interesting to study; it allows us to make a comparison between a number of related aspects. The key question here is whether in 1715 they had learnt anything from the previous flood disaster and, if so, what? In order to answer this question, we need to study risk management and understand how the coastal lowlands were protected against flooding and also learn what changes were made during those intervening years. Furthermore, we need to have some understanding of how our contemporaries perceived such flooding disasters. Therefore, a knowledge of several factors that determine perception is required. But first, we must look into the causes and consequences of the flooding events and put them into a wider spatial and temporal context.

10.2 Flood and Weather Data of 1682 and 1715

There are numerous accounts of both the 1682 and the 1715 flood. In this section, two detailed descriptions will be given and discussed along with the context of the weather events of the months preceding the flooding events:

> [1682] On 26 January 1682 there was a big tempest with a high flood which according to reports coming out of Antwerp was never heard of before. It very vehemently flooded the polders of Kallo with an area extending as far as the Vlaemsche Hooft. Thanks to their high sea walls only Verrebroek, Schoor and Beverenpolder managed to keep dry. Meanwhile the wider area looked like a deluge with only dead people, animals, grain, household goods, barns and stables floating in the water in such large numbers that it was hard to describe. Damage was estimated at several millions and thousands of people were ruined [. . .] Officials who visited the disaster area were told stories of people fleeing to roof tops of houses and barns and stables, who could only be rescued by using rowing boats. However, many rowing boats did not venture into the flooded area at all because of fear of being shipped wrecked, as the tempest lasted for several days. Therefore many starved on rooftops or suffered other inconveniences. In the town of Antwerp the flooding caused extremely large damage to storehouses of merchants leading many to the brink of bankruptcy. In the main church of Antwerp the flood piled tombstones one on top of the other causing graves to collapse. In the cemetery of the Vlaemsche Hooft corpses were even lifted up from their graves . . . [1]

> [1715] Yesterday afternoon there was a severe storm blowing from northwest and a very extraordinary high tide, even higher than the 1682 flood, when we had a large scale flooding. Several polders in our district were flooded such as Clinge, Cambron, Namen,

[1] Municipal Library at Kortrijk, ms. 175, fol. 460.

> Speelmanspolder, Wilhelmuspolder near Walsoorden and Ser Arendspolder and others were flooded such as Klein Kieldrecht, Dullaert, Langendam etc. which inundation and flooding have been largely caused by breaching the Clinge sea wall at several spots . . . [2]

From the two descriptions of the extreme weather events of 1682 and 1715, it becomes clear that a heavy gale along with a high springtide was the main cause of the large-scale flooding in the southwestern Netherlands and adjacent Flanders (Antwerp). Whilst the 1682 flood, happened in midwinter and the storm was seen to last longer than one day, the 1715 flood occurred on 3 March, whilst the storm lasted barely one day. This difference in duration actually implies that during the 1682 flood, there must have been three or at the very least two successive springtides funnelling water to extreme heights in the estuaries of the southwestern Netherlands. Fortunately, the winter of 1682 was rather mild; so at the time of the flooding on 26 January the weather was mild, which would have caused less suffering for those unfortunate enough to lose their homes. It was only by the end of that month that frost set in, interrupting shipping on the canals for no more than a week. March 1715 was mild too and frost had lasted barely 2 weeks in January, and so there would have been no further suffering from cold either. Both accounts go on to give details of the damage caused, especially of the areas flooded and material damage done to buildings. The 1682 account gives information about regions affected further north in Holland, whilst the 1715 account gives more details on the damage inflicted on the fortification of Hulst, the town located within the flooded polders. Details on specific damage and human suffering in 1715 are not given in the account.

Documentation on the weather conditions prior to the flooding of 1682 is available from the dairy notes of Claes Arisz Caescooper (1669–1729)[3] a miller and shipowner who lived north of Amsterdam. January of that year was a mild winter month. On 13 January, the wind was blowing from the south, changing west during the afternoon. This continued the next day, whereafter the weather improved. This storm caused damage in Holland and on the isle of Texel. On 21 January 1682, another storm arose from the west which caused barges in Holland to stay in their harbours. On 24 January 1682, there was a full moon, and two days later there was a springtide, whilst there was a northwesterly gale blowing. This was the third storm during that month and again caused barges to remain in their harbours. Damage was also inflicted on sea walls in Holland.

There is more information about the prevailing weather conditions in 1715. According to the diary of Caescooper, the temperature in January 1715 barely fell below freezing and the first half of February was very windy, changing into a storm between 10 and 12 February. Then some days of frost followed. March began rough with a storm blowing from the west to the northwest, which continued the next day and also saw rain. On 20 March, there was another storm, but the register of observed wind direction at Bilderdam clearly specifies that this storm began two days later, the reason for which remains unclear.

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[2] Zealand Archives (Middelburg), Hulsterambacht, no. 24. Resolutions magistrate 1715.

[3] Regional Archives (Haarlem), Honig Collection, no. 125, diary Caescooper (Buisman 2000, 622).

Fig. 10.1 Southwestern Netherlands mapped by Johannes Bleau, mid-seventeenth century. The different colours refer to different administrative areas. *Red* is the province of Zealand with its capital city Middelburg on the island of Walcheren. North is the island of Schouwen and Duiveland with the town of Brouwershaven. East is the island of Tolen (Tholen) and south of Schouwen is the small island of North Beveland. The *yellow-orange* areas are the islands of Goeree and Over-Flackee (Overflakkee) located north of Zealand. Niervaert or Clundert is east of Willemstad. The *green* area down below separated from Zealand by the Western Scheldt is Zealand Flanders with its towns of Hulst, Axel, Ter Neuse (Terneuzen), Aardenburg and Sluis. *Bottom right* on the west bank of the river Scheldt are the villages of Verrebroek and Callo, and on the east bank of the river is the town of Antwerp (mentioned in 1682)

A report from the island of Schouwen and Duiveland (Fig. 10.1), made by the officials of the local water boards, gave the following information about the weather conditions (Kool-Blokland 2003, 90). Several days before 3 March 1715, a strong south to southwesterly storm had risen, pushing the incoming tidal water to extreme high levels. Two days before new moon, the storm all of a sudden changed from a southwesterly into a northwesterly dangerous springtide, pushing incoming tides to an even higher level, which observers had never witnessed before.

It will become clear that both flooding events took place during heavy gales occurring at the same time as a springtide thus right after a new or full moon. These are conditions which often create storm surges (De Kraker 2006).

10.3 Consequences, Risk Management and Measures Taken

Both storm surges caused large-scale damage to sea walls, sluices and the dune areas in the southwestern Netherlands and adjacent Flanders. In many areas, this kind of damage was so huge that it caused large-scale flooding. In harbour towns, the storm surges caused damage to groynes[4] and piers, whilst at sea, dozens of ships were lost, as happened in 1534 when 40 herring boats were shipwrecked (Buisman 1998, 441).[5] Moreover, the strong winds also caused damage to high buildings and to windmills in particular. The way the sea defences were built and in particular the height of their top levels tell us already a lot about risk management.

Late medieval and early modern sea walls were constructions that were solid enough to withstand average floods and even spring floods during the stormy winter season. The baseline of dikes usually ranged from 20 to 30 m, whilst they had top levels of 3.5–4.0 m. The main body of a dike was built of fine clay. The gentle seaward slope was reinforced with a double layer of sods. Twice a year this slope was further protected by putting bundles of wicker or a straw mat on it which were fastened onto the sods with bands tied to short wooden posts. The first round of maintenance, the summer upkeep, occurred in spring and the second one, the winter upkeep, occurred in autumn. As the storm season began in autumn, a thicker straw mat was fastened onto the seaward slope of dikes during the second upkeep. If damage occurred into the layer of sods, this needed to be repaired within three tides. If large-scale damage occurred, this could even lead to an extra round of maintenance. The steeper, landward slope was covered with a single layer of sods. If rough tides caused gaps in the wicker bundles or straw mats on the seaward slope, even the sods on the steep slope could be washed out. Under these circumstances, fast repairs needed to be carried out. Therefore, officials were required to be present on dikes during tempests in order to undertake immediate action. However, if the springtides were accompanied by gale force of 8 or more, water could be pushed over the top level causing gaps on the landward side. Depending on the duration of the storm, such circumstances could easily lead to the collapse of the dikes and, subsequently, flooding.

Apart from the technical aspects of sea walls and their maintenance, there was another kind of reducing risk. If salt marshes became silted up high above mean tide, they automatically could be embanked; this was the process of embankment

[4]Groynes are low walls built out into the sea to prevent it from washing out sand.

[5]Royal Library Albert I (Brussels), ms 17,243, fol. 83ro. This storm occurred on Saint Martin (11 November 1534).

continuously moving on. As each next embanked polder faced the sea directly, the older polders became further inland areas and eventually became completely cut off from the sea, and as a result of this, their dikes lost their original function as a sea defence. But these old dikes were never removed, and using them as pasture and roads, they could still function as a sea wall during flooding of the polder positioned in the front and thus confine the area of flooding. Therefore, this kind of compartmentalization of a coastal landscape was by far the best guarantee for confining floods to smaller areas. Besides, it often happened that newly embanked areas had to abandon their first dike by building a secondary or reserve dike right behind it. Such a secondary dike was another dike built on the inland side at some distance from the sea wall which functioned as a reserve dike in case of collapse of the sea facing dike.

Harbour towns were faced with damage to piers, groynes and even their docks. Most of these constructions were made of wooden posts driven into the ground and lots of heavy planks. Piers and groynes could also be filled with earth and stones. When a gale was blowing at springtides, these constructions could easily give way under the pressure of the battering incoming waves. We do not know if the physical presence of officials at spots at risk in harbour towns was required, but it is known that day labourers could be summoned to assist in preventing flooding during extreme weather conditions. Usually, church bells were rung or fires were lit on top of flat church towers to warn neighbouring communities of the danger that lurked on the coast.

As soon as town authorities and water boards had a clear picture of the damage caused by a big flood, they usually started writing letters to higher authorities such as the provincial government telling them the nature and extent of the flooding and the kinds of measures already under way. Initially, water boards were not entitled to any kind of help because according to customary law each polder had been embanked at their own risk. They only required the permission of the count of Flanders, who usually granted it on certain conditions from which he benefited in terms of a modest land tax and a whole new farming community settling the new lands. Those who actually ventured to embank a salt marsh enjoyed all the benefits of the new lands in terms of crop return. On the other hand, those who embanked also had to maintain their own dikes. If the new embankment proved to be a failure, for instance because of the expense of dike maintenance, they could use the right of abandonment, which usually led to the flooding of the embankment. Nevertheless, a lot of requests asking for financial assistance were granted by owners of neighbouring polders, because they would suffer the consequences of higher dike maintenance in the future if the flooded ‘fore lying’ polder would not be re-embanked, since their secondary dike would then become the first sea defence again. According to customary law, owners of such polders were legally obliged to contribute to particular costs, such as the initial adjacent embankment and the building of a sluice if they also made use of it. Flooding of a polder and its re-embankment were considered a similar circumstance in which neighbouring polder owners might contribute to the overall cost of the works undertaken. Other requests asked for direct help from the provincial government by way of a tax reduction for

a number of years. Such kinds of requests were made during the largest floods and if flooding was caused by warfare. In coastal Flanders, many such requests were granted during the sixteenth-century flooding events, for instance in 1509 and 1530, when polder owners were granted up to 25% of tax reduction. There is only one exception to this rule, when in 1494 a large new ring dike was built to re-embank lands that had flooded after 1488 and the count of Flanders asked the Estates of Flanders to contribute a large sum of money, which they did (De Kraker 1997, 28–29).

In 1682, officials of areas hit by the flooding informed the provincial government. The report was sent only three days after the disaster had hit the island of Tholen, painting a picture of its rural communities in complete disarray.[6] Two breaches in the dike had caused the flooding of the polders surrounding the small town of Tholen. People had left the flooded lands and had taken refuge in the town. From the town walls, dead cattle as well as barns had been seen floating by. Moreover, in the villages and hamlets on the island, many houses had been destroyed causing people to flee elsewhere. Finally, there was damage to the fortification of the town. The report did not give numbers of casualties or the extent of material damage.

Other reports were more detailed, such as the report sent to the Estates of the province of Zealand by Heerder about the damage caused to the island of North Beveland (Table 10.1).[7] Seven out of 13 polders had been flooded, totalling 1,061 ha, or 24%, of the surface of the island under water. This report was sent on 20 February 1682, which implied that three polders had already been repaired, whilst four others remained inundated, totalling 549 ha, or 12%, of the surface of the island. Although damage to crops of certain polders is mentioned, there is no mention of buildings destroyed or other kind of material damage. Only three people died in the flood. The report goes on complaining of how hard it was to hire day labourers to carry out the necessary repairs and also that there was a shortage of dike materials because everywhere the demand for these materials was high (Fig. 10.2).

Some reports asked for some kind of direct assistance. One such report was for the polder of Walcheren on the island where the provincial capital was. This request also initiated the delicate discussion about who could be held responsible for the flooding (Hollestelle 1996, 73–74).[8] Tenants of the Nassau manors in the polders in the Hulst area, of which 15 (6,440 acres) had been flooded, asked their landlord for a reduction of the yearly rent. In half of the polders, the whole year's rent of farmers, already taken, was repaid (De Kraker and Bauwens 2000, 24). The owners of the flooded areas also requested the government for a remittal of their yearly tax.[9]

[6]Zeeland Archives (Middelburg), Estates of Zeeland, no. 1297. Letter of 29 January 1682 by Johan van Vrijberghen.

[7]Zeeland Archives (Middelburg), Estates of Zeeland, no. 1297. Heerder, most probably the local sheriff or chair of the largest local water board, was authorised to report to the provincial Estates of Zealand.

[8]Zealand Archives (Middelburg), Polder van Walcheren, no. 199. February–March 1682.

[9]National Archives (The Hague), Nassause Domeinraad, no. 41 (res. 2 March 1682).

Table 10.1 The damage of the 1682 flood on the island of North Beveland

Name of polders	Hectares	Kind of damage
1. Kampensnieuwland	n.d.	Flooded through two breaches but repaired within 8 days
2. Wissekerkepolder	512	Flooded 10 days
3. Oweleck	169	Flooded through 30 breaches
4. Layeplate	168	Flooded and probably lost
5. Polder Oud-'sGravenhoek, combined with		Flooded
6. Oudnoord-Beveland	1,706	Damage to dikes
7. Alteklein	9	Flooded, but no breaches, dry again within 6 days
8. Catspolder	65	Flooded through five breaches and all crops destroyed
9. Fredericxpolder	451	Not flooded
10. Geersdijkpolder	256	Not flooded
11. Cortgenepolder	239	Not flooded
12. Nieuw-'sGravenhoek	138	Flooded
13. Nieuwnoord-Beveland	447	Not flooded
14. Nieuw-Wissekerkepolder and Outcampen	200	Not flooded
		Other consequences of the flood
		Three children drowned
		Few cattle drowned
		No data on buildings
Total	*4,360*	

Source: Zealand Archives (Middelburg), Estates of Zealand, no. 1297

On the island of Schouwen and Duiveland, the sea damage was caused by two breaches in the sea defence on the eastern part of the island (Kool-Blokland 2003, 87–88). An area around the fishing town of Brouwershaven was also completely flooded. Although only a few people were drowned, the number of drowned animals, such as horses, cows, pigs and sheep, was significant. Attempts by the local water boards and districts to plea for financial assistance from the provincial government failed (Kool-Blokland 2003, 88–89). Apart from the ordinary and necessary repairs, no extra measures were taken at this time.

Besides the report sent from North Beveland and one on the situation on the island of Schouwen and Duiveland, there is a report from an area south of Axel, written many decades after the flood, which gave the following account: 'the general high flood of 26 January 1682 caused the drowning of many of my neighbours, in the parental house of my father's side fourteen people had fled to the living room above the cellar during the night and standing in the water which reached as high as their shoulders they died from fear and cold, forty cows and horses had tried to stay alive swimming around the house until they drowned completely exhausted'(De Vleesschauwer 2012, 45). This account clearly demonstrates that in spite of the mild winter, there may have been more severe conditions existing at that time than most

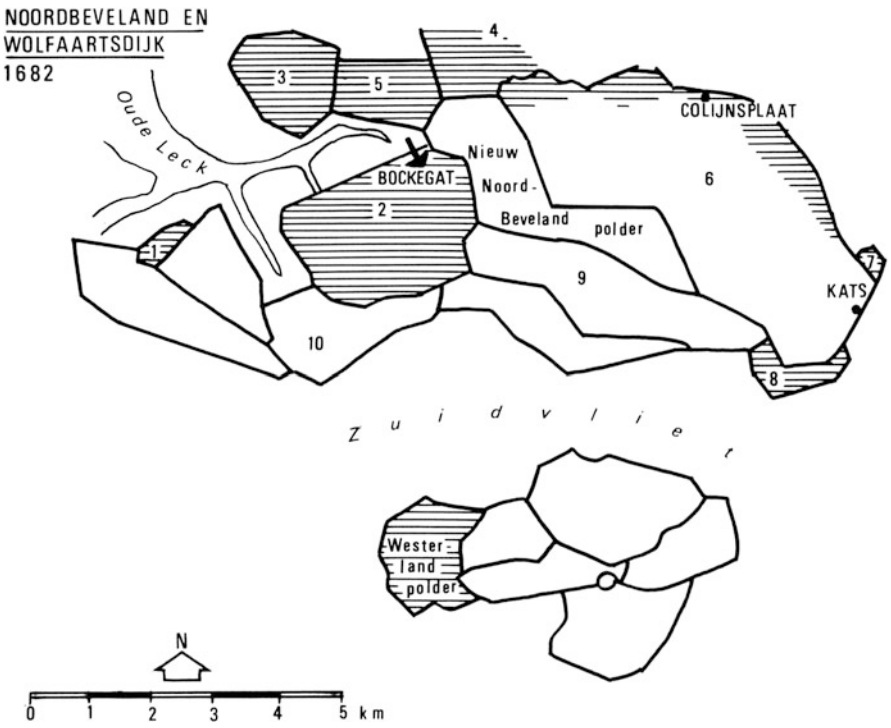

Fig. 10.2 The island of North Beveland and the impact of the 1682 flood. Polders *shaded* were flooded and are listed in Table 10.1

reports allow us to believe. Why this report was written remains unclear; however, the person who wrote it became a member of the local water board where this document was kept amongst the records of the board.

In terms of consequences and measures taken afterwards, there were similarities but also significant differences between the 1682 and 1715 flooding events. Again the officials of the areas hit by flooding informed the provincial government of the bad news. However, in their letters, they often referred to the 1682 flooding and the number of storms that had preceded the 1715 storm surge. This means that contemporary officials in 1715 still had a fair knowledge of the 1682 flooding 33 years before and were therefore able to make comparisons. But unlike damage experienced in 1682, the damage caused in 1715 was different because it was partly caused by storms that hit the area earlier in 1714. Especially the storms of 26 February 1714 and 4–7 March 1714 and a gale on 12 February 1715 were partly held responsible for the wide-scale damage in March 1715. As a result of these preceding storms, by March 1715 a number of weak spots in dikes had already been repaired. The storm surge of 3 March 1715 undid most of these repairs, and many of the repairs carried out right after the flooding were again seriously hampered by

the storm of 4 April 1715. For many contemporary officials in 1715, all of these preceding and succeeding storms made the circumstance in spring 1715 even worse than it really was.

A report from the Klundert area (Clundert on Fig. 10.1) states that houses that were washed away by the flood of 7 March 1714 were again washed away by the flood in March 1715. Of some houses, only parts of the walls remained erect.[10] Tenants of some polders flooded at St. Maartensdijk on the island of Tholen (Tolen on Fig. 10.1) asked their landlord for remittance of rent for a 3-year period. They only got a quarter remitted.[11]

A report from the island of Schouwen and Duiveland, in which the weather conditions have already been discussed, also made several comparisons between the 1682 and 1715 floods. The dike breached again in 1715 at the same location as it did in 1682 causing flooding of a large part of the island. For the second time, the area suffered from the penetration of sea water and was flooded. In the town of Zierikzee, water flowing from the harbour penetrated cellars of houses in the old town and then headed straight towards the new town areas washing out the pavements from the streets (Kool-Blokland 2003, 90–91). Most interesting is the comparison of the highest water levels recorded. In 1715 water was recorded 32.4 cm higher than 1682 and even 55 cm higher than All Saints Flood of 1570 (Kool-Blokland 2003, 89).

Surprisingly detailed are the requests made from the district of Hulst (Hulsterambacht). The aim of the requests was to obtain remittance of annual taxes. In order to demonstrate the damage sustained, inventory lists of all the damage in each of the polders were made (Table 10.2). From this it becomes clear that actually nobody drowned during the flood and apparently no animals seem to have been lost. This implies that flooding had not completely taken the inhabitants by surprise and so they must have been able to drive their animals to safety on top of secondary dikes or one of the polders further inland that had remained dry.

The biggest damage was the loss of crops, especially wheat and barley which were the main crops grown in the very fertile soils of these commercially exploited lands. Also rape seed being a winter crop was destroyed. There was also damage to orchards. This must have been a rough guess because real damage can only be assessed during late spring and summer when fruit trees bear fruit. The kind of damage caused also depends on the duration of the flooding. This also largely applies to pastures where the damage had been assessed. Damage to buildings usually refers to barns that can be lifted by water and moved; so they have to be rebuilt. Damage to dikes usually consists of breaches and as a result of this the washing away of earth, often also of the landward slopes of a dike if water merely overflows its top level. Sluices can be damaged too by a strong current of water that needs to discharge from flooded polders. Such currents destroy sluice doors and are often erosive underneath sluices as well, leading to a dislocation of the sluice floor and possible future malfunctioning, because on the one hand such a sluice

[10]National Archives (The Hague), Nassause Domeinraad, no. 74, res. 15 April 1715.

[11]National Archives (The Hague) Nassause Domeinraad, no. 74, res. 1 May 1715.

Table 10.2 Damage assessment of the 1715 flood in the district of Hulst

	Langendam		Kruispolder		Dullaert		Cambron		Kieldrecht		sArendsp.		Klinge	Stoppeldijkp.
Kind of damage	ha	guild.	ha	guild.	ha	guild.	ha	guild.	ha	guild.	ha	guild.	guild.	guild.
Size	470		670		555									
Winter crops	268	3,600	30	298.4	278	3,421	100	12,150						206
Summer crops	156	1,575	35	154	223	2,000	40	5,220	92	820	20	2,640		
Clover							27	1,980	36	320				
Pasture	34	125	20	54.35	55	182.1								
Orchards		225				900								
Buildings		800				750		4,600						252
Dikes, sluice		320		266.7				12,000						756
Stored grain								3,000		30			27,056	
Soil damage							268	20,400						
Total		6,645		769.8		7,253		59,350		1,270		2,640	27,056	1,214

Source: Zealand Archives (Middelburg), Hulsterambacht, no. 5891 guilder = 20 shillings = 8–10 days of labour

leaks fresh water during the dry season and salt water during high tides. Stored grain in barns can be completely washed away if barns are lifted and destroyed, but what was more likely to have happened was that the grain merely became wet and rotted. Finally, there is the fact that soil damage caused by erosion and deposition of fresh sediments could be valued in money in 1715 looks like quite a modern response to flood damage. This sort of damage which affects the soil content in terms of degrading fertility and changing hydrology has only been assessed for the Cambronpolder. This polder was embanked in 1709 and bordered directly at the sea and therefore faced flooding directly (De Kraker and Bauwens 2000, 27).

Some requests demonstrate that lessons from the past actually had been learnt, for instance concerning indirect damage caused by salinity. One such request, asking for tax reduction, was made by the landowners of several polders around Terneuzen. Some polders were flooded in 1682 but reclaimed again. At that time, the owners had been allowed remittance of taxation for 2 years, but since then the soil had remained brackish for some years. As a result, the 1715 request could be sustained by extensive evidence of financial losses suffered since 1682.[12] Apart from again requesting a remittance, the landowners now decided to raise the top levels of their dikes, which they had not generally in 1682. Strongly convinced of the need for changing dikes, most water boards with sea walls only reluctantly took such a decision because such a drastic measure was very expensive (Kool-Blokland 2003, 92; De Vleesschauwer 2012, 44–47, 53–56). It also implied that top levels of sea walls had been too low for a number of decades, resulting in risks of flooding that could have been avoided if the top levels had been raised as suggested above. In fact it goes on to show that top levels of dikes were already too low in 1682, and as a result, the risks of flooding then were already too high. The main reason for this is a lack of funding by landowners. It needs to be said that most embankments were investments in that they claimed land that could be used as arable land. As long as prices of grain were high, such investments were relatively safe, but as soon as prices for wheat and other commercial crops dropped (1650–1740), profits for landowners and farmers dropped accordingly, and as a result of this, saving on dike maintenance was a logical solution (Van Cruyningen 2005/2006; De Kraker 2011).

In other areas hit by the 1715 flood, such as the isles of Goeree Overflakkee and the Polder of Namen, things became still worse. On Goeree Overflakkee, the remaining dikes and sluices in the flooded lands were again hit by storms in the next 2 years. Consequently, reclamation of these lands had to be postponed until a committee for re-embankment was formed in 1717–1718 and paved the way for large-scale re-embankment.[13] The worst kind of measure taken was the abandonment of a flooded area. This happened, for instance, at the Polder of Namen on the banks of the Western Scheldt. Although this polder flooded in 1682 too, it was re-embanked at high costs within a few months. Re-embankment after the

[12]Zeeland Archives (Middelburg), Estates of Zealand, no. 1927, requests sent from Terneuzen (March 1715).

[13]Regional Archives of Goeree Overflakkee (Middelharnis), Commissie Herdijking 171–1737.

1715 flood appeared to be too high a financial burden at this time (De Kraker and Bauwens 2000, 25–26). In fact the landowners simply followed the medieval custom of abandoning the lands on which they were unable to maintain the sea walls.

Finally, looking at the measures taken by the provincial government and the national government in The Hague, it becomes clear that initially they allowed tax reduction, but the provincial government went a major step beyond. Across the province of Zealand, the number of polder landowners and in particular their water boards asking for financial relief had increased dramatically over the years (Hollestelle 1996, 74). Most polders of these begging water boards faced the risk of flooding. This was often the combined cause of erosive channels approaching the baseline of their sea walls and extreme weather events such as gales and storm surges. As a last resort before abandoning their lands, the polder boards turned for help to the provincial government, which began to implement new legislation on this issue. Nevertheless, it took almost a century before new regulations became effective. By 1791 the provincial government issued a regulation for these calamitous polders (De Kraker and Bauwens 2000, 62–69; De Vleesschauwer 2012, 82–83). It allowed them to apply for financial assistance on a number of strict conditions. One such condition was that the provincial government had to examine the books of the applying polder board, and in so doing it lost control over its finances. And because the neighbouring polders always had to contribute a fixed taxation per acre to a calamitous polder, which strongly opposed the principle of each polder defending its own dike, it took so long to implement the new regulation. During the French occupation of the Low Countries (1795–1813), the policy, as applied to calamitous polders, was further developed into a set of detailed regulations, and in 1871 calamitous polders became a separate category of polders. By then, risks were shared by a much larger area surrounding the calamitous polder as well as financial relief which was given by both the provincial and national governments. After the 1953 flood, the large-scale reorganisation of water boards spread the risks even further. Today, there is only one water board in the province of Zealand left, whilst there were still over 300 in 1900.

10.4 Perception of the Floods

In order to understand how the 1682 and 1715 floods were perceived, there is a need to elaborate a bit on the background in general as well on particular factors that determined the way contemporary people perceived extreme weather conditions.

One factor that has an influence on perception is the natural environment in which people that were faced with flooding lived. These are the coastal lands protected by brittle sea walls that can be breached any moment during the storm season. People living there were well aware of the danger of flooding and tried to reduce the risks to the minimum as outlined above.

This awareness of the risk of flooding could be strengthened by the frequency of flooding. The higher the frequency of such disasters, the higher the awareness and

accordingly the more appropriate the measures that could be taken. In this respect, the sixteenth century still remains the outstanding century during which some areas were faced with as many as six flooding events (1509, 1511, 1530, 1532, 1552 and 1570) (De Kraker 1999, 2006).

If flooding occurs more often, people tend to compare floods especially in terms of the highest water levels reached. Such comparisons often result in a kind of grading of flooding events because there will always be one which had the highest water levels or lasted longest or caused the largest-scale flooding. In order to measure heights, flood marks were installed at big sluices and bridges. As far as the six flooding events of the sixteenth century are concerned, we now know that the 1530 and 1570 hazards stand out as the megaflooding events whilst the other four were of a similar magnitude but slightly less severe at least in terms of areas flooded (De Kraker 1997). A comparison of the floods of 1682 and 1715 clearly demonstrates the use of such flood marks, but this has a much longer history. During the 1682 flood, Gabbema (Gabbema 1718) says water stood 9–10 feet high (2.5–2.80 m) on the wharfs of Antwerp, which seems to be extremely high, whilst at Dordrecht, levels reached ten thumb (0.25 m) higher than the St. Nicolas flood and 3–4 ft (0.75–1.00 m) higher than the 1421 flood. Details on the level the flood reached in 1715 have already been discussed. So installing flood marks as evidence of public awareness goes straight back to the early fifteenth and sixteenth centuries; for example the 1530 flood, observed at Antwerp, was estimated to have reached one foot higher than ever before.[14] It also demonstrates that flood marks had become a part of the collective memory in coastal lands, especially in the larger ports such as Antwerp and Dordrecht. In spite of the reference to flood marks, many contemporaries still used the expression 'never seen before . . . ' or 'never heard of before . . . ' (Table 10.3, no 1). These expressions are mostly sheer rhetoric and were also used to describe other extreme weather events (Pleij 1988, 55).

Another factor that determines perception of the event lies in the terminology used to describe the event. A number of different quotations describing both extreme weather events have been summarised in Table 10.3. It follows that normally a standard set of terms was used. Terms such as high/latest/extraordinary/severe and flood/storm/tempest/sea/storm and/or wind are most commonly used. This practice already goes back to the late fifteenth and sixteenth centuries and was more common for administrative sources rather than narrative sources (De Kraker 1999, 2005). Comparing the 1682 and 1715 quotations shows that the set of quotations from 1715 have begun to look like a set of standardised terms: storm, flood and inundation. This seems reasonable within the context of the many storms that hit the area from 1714 onwards; the March 1715 storm was only one of them but unfortunately the severest one. Here, without any doubt, the high frequency of the storm events (1713–1715) has also contributed to the use of a standardised set of terms.

Closely connected with terms used in written reports is the source: who is talking or writing about the event and what is the interest of the source (Rohr 2007, 52–53;

[14]Royal Library Albert I (Brussels), ms II-1593, 5–6.

Table 10.3 Quotations of the 1682 and 1715 floods

Quotations 1682	*Source*
1. High flood never heard of before	ZA Polder Walcheren, no. 199
2. The last high flood	ZA Polder Walcheren, no. 199
3. In the storm	RAG Water board St. Maartensdijk, no. 69
4. In the extraordinary storm/high flood	RAG Water board Molenpolders, no. 17
5. Inundation	RAG Water board Weijpolder, no. 15
6. Big and excessive tempest	NA Bruges Vrije van Bruges, no. 106
7. The tempest and high sea	Municipal Archives Bruges, barges
8. The extraordinary flood	ZA Water board Poortvliet, no. 88
9. Severe storm and high flood	ZA Water board Oude Kraaijerpolder, no. 37
Quotations 1715	*Source*
10. Severe storm	ZA Water board Scherpenisse, no. 134
11. High flood	RAG Water board Dirksland, no. 79
12. Inundation	RAG Water board Galathepolder, no. 20
13. Latest storm	NA, Nassause Domeinraad, no. 74, (res. 15 March 1715)
14. The severe storm wind and extraordinary high flood	ZA Staten van Zeeland, no. 1297, (letter 29 January 1682)
15. Severe storm from NW and a very extraordinary high flood, even higher than the 1682 flood	ZA Hulsterambacht, no. 24, (res. 4 March 1715)

ZA Zealand Archives, *RAG* Regional Archives of Goeree Overflakkee (Middelharnis), *NA* National Archives (The Hague)

Lamarre 2005, 10–20). All quotations listed in Table 10.3 come from administrative sources, mainly from water boards or officials of local governments.

On the one hand, these people are used to dealing with such events; they want to undertake action fast, and so they do not make too much fuss about it. On the other hand, if they ask for assistance, they undoubtedly would want to describe how bad their situation actually was and that they were in desperate need of aid. This would imply a representation of the situation in excessive negative terms. In a lot of such cases, they would add, for instance, 'never heard or seen before' (quotation 1). In some cases, they would refer to God, which the water board of the polder of Walcheren actually did in 1682. The reason is clear: if God is responsible for the disaster, the water board certainly was not and therefore could not be blamed for overdue maintenance as well. Usually, this led to long-term quarrels between local authorities, such as the water boards, and the provincial government without anyone taking adequate measures.

The latter leads us to religion as a determining factor for perception (Rohr 2007, 62–64; Mauelshagen 2009). Divine Punishment or the Last Judgement are expressions that are used less frequently than often presumed. This very much depended on the fact who the person behind the information was and what the purpose of his writing was. In fact in the late seventeenth and early eighteenth centuries, Low Countries religion only plays an important role amongst strict Calvinists. Unlike the Christmas flood of 1717 that devastated the coastal lands of

Northern Germany (Jakubowski-Tiessen 1992; Hagen 2005, 65–75), the 1682 and 1715 floods in the study area did not cause thousands of casualties. As only a small number of people drowned, hardly any sermons were held in the Low Countries, unlike those held after the floods of 1634 (Allemeyer 2006, 293–318) and 1717 in Northern Germany. Moreover, there are hardly any quotations that refer to Divine Wrath or to the Biblical Deluge. Only the first extended quotation of the 1682 flood coming from Antwerp refers to a deluge, but this term is used to underline the large-scale devastation of the event; there is no further mention of God intervening or His Punishment.

An outstanding example of religious perception of flooding and floods is perhaps Jacob van Oudenhoven, a Calvinist minister, who published a book on floods (Oudenhoven 1682). Surprisingly enough the description of the 1682 flood takes up <10% of his book. In the introduction, Oudenhoven explains the chief aim of his book which he dedicates to a Haarlem magistrate who said: 'In all countries we find the Hand of God responding to sins with his plagues . . . using the elements of climate . . . .' In the Low Countries, the most important element God uses is water, but this has been enclosed by man through embankment. As a result of this, God punishes through floods. And because people tend to forget easily, Oudenhoven gives a survey of historic floods as a mirror for people to keep on following the good faith or repent. It therefore comes as no surprise when he starts his survey with The Deluge. Oudenhoven lived in or near Haarlem, where his book was published. His writing in the form of books or more usually pamphlets must be seen in the tradition of evangelising the Gospel. Most of the authors were actually vicars, and indeed, Oudenhoven was such a vicar.

Other intellectuals writing about causes of flooding did not refer to Divine Intervention but rationally analysed all possible causes ranging from changes occurring in estuaries and tides, to neglect of upkeep of sea defences caused by warfare, quarrelling amongst water boards, removal of secondary dikes and other possible causes, which Oudenhoven does not mention explicitly (Gabbema 1718).

Finally, weather extremes and in particular flooding events could also be perceived differently per social class. However, the various social classes involved in or hit by flooding were mostly farmers, landowners and day labourers working on farms and living in hamlets and villages that were flooded. Judging from the documentary evidence of both floods, mainly the landowners and farmers can be traced, through their influence in the water boards. Their chief aim was applying for financial assistance from higher authorities and neighbouring polders, as has been described. If landed property was spread out in several polders or in even wider areas, they could benefit from this, because flooding, for instance, generally was limited to polders that bordered directly on to the sea and some in the vicinity. There is no evidence from the poor classes hit, but judging from the many reports, those hit by flooding could not apply for any kind of help, except for getting relief provided by charity institutions or perhaps the church of their parish.

10.5 Conclusion

In this chapter, the 1682 and 1715 floods were compared questioning whether contemporaries of 1715 have learnt anything from the first flood. Both floods hit the coastal lands of the southwestern Low Countries and led to a large-scale flooding of roughly the same embanked areas. Although probably over 20,000 acres were flooded and the material damage (sea walls, buildings and crops) in those areas must have been very high, the number of casualties was fortunately very low. Whilst in 1682 no drastic measures were taken other than conventional repairs of sea walls and sluices, the 1715 flood compelled water boards to change the construction of dikes by raising their top levels by 0.3–0.5 m. Whilst both flooded areas asked for remittance of rent and taxation, which was usually granted for 1–3 years, in 1715 financial requests went one step further. In 1715 landowners and water boards knew the damaging effect brackish water had on the fertility of the soil leading to years of low crop yields after 1682; so many polders asked for extra financial assistance. This in turn led to the gradual implementation of new regulations in coastal management and water management, becoming really effective only as late as 1791. Thus, the 1715 flooding and its aftermath were dealt with more efficiently: damage was assessed more precisely, it changed dike building, and the 1715 flood became the start of new legislation. From a comparison of the two flood disasters in terms of perception, the following may be concluded. Most likely due to the natural environment of the coastal lowlands, which were always at risk of flooding during the storm season, contemporaries have perceived the flooding events remarkably objectively, almost dealing with them as their daily business. Moreover, the flood of March 1715 cannot be detached from the large number of severe storm events that took place in quick succession in a short span of time (1713–1715), of which the last in March 1715 was the most destructive. There is hardly any doubt that the poor classes suffered most from both floods. Day labourers and small peasants had little resources to rely on generally being confined to small areas, whilst big landowners had widely distributed assets which were seldom hit all at the same time.

Acknowledgements Thanks to Dr. Sjoerd Kluiving, Institute for Geo- and Bioarchaeology (IGBA), VU University, Amsterdam, and Mr. Roger Pendery (Terneuzen) for their advice.

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