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Publication date
2017

Document Version
Final published version

Published in
Integral Design of Multifunctional Flood Defenses

Citation (APA)
Brand, A. D. (2017). Governance and planning as boundary conditions for flood risk reduction in Texas: Galveston Island's flood risk challenge. In B. Kothuis, & M. Kok (Eds.), *Integral Design of Multifunctional Flood Defenses: Multidisciplinary Approaches and Examples* (pp. 158-161). Delft University Publishers.

Figure 1.
Galveston Island, residential area and dunes along the Mexican Gulf coast (Photo courtesy Baukje Kothuis).

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GOVERNANCE AND PLANNING AS BOUNDARY CONDITIONS FOR FLOOD RISK REDUCTION IN TEXAS

GALVESTON ISLAND'S FLOOD RISK CHALLENGE

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Galveston Island is a barrier island with a population of approximately 60,000, located between Galveston Bay and the Gulf of Mexico on the Texas coast. Due to its location, Galveston is not only on the front line of hurricane-induced storm surges coming from the Gulf, it is also a key site for any flood defense aiming to protect the entire Houston-Galveston Bay region. The island and its namesake city's history have been marked by devastating storm surges, most notably the 1900 Great Galveston Hurricane, and Hurricane Ike in 2008. The 1900 hurricane left an estimated 6-8000 dead and prompted the elevation of the entire city by approximately 10 feet, plus the construction of the Galveston Sea Wall on the Gulf-side (Bellis Bixel & Hayes Turner, 2000; Wright-Gidley & Marines, 2008). The back and west end of the island remain unprotected, and as a result were flooded during Hurricane Ike in 2008.

Given its vulnerability and key importance to stopping storm surge for the region, Galveston Island is also the cradle of one ambitious flood risk reduction proposal: the Ike Dike, sometimes known as the Coastal Spine. Despite its high vulnerability to flooding, the Bay region's current tradition regarding flood risk reduction remains haphazard: a patchwork of different organizations, primarily reacting to flood damage after the fact, and, from a Dutch perspective, an impressive and sophisticated form of emergency management (Brand & Hogendoorn, 2015). The Bay region's flood risk challenge is currently being analyzed by the US Army Corps of Engineers in the Coastal Texas Protection and Restoration Study. Existing large-scale flood defenses that aim to prevent flooding, like the Galveston Sea Wall or the Texas City levee, were only built under exceptional circumstances: after a flood event, and with considerable financial support from federal agencies.

An enquiry into Galveston's governance arrangement for flood risk reduction

In contrast with the Netherlands, where flood risk reduction has focused on prevention, constructing a flood defense in Texas may thus face considerable obstacles. Future strategies may still go in the other direction, with spatial measures that reduce vulnerability to flooding, rather than preventing it. As such it's worth investigating governance and planning as boundary conditions for the first two components of the multi-layered safety approach: prevention and spatial planning (STOWA, 2017). What kind of agencies are involved in flood risk reduction and spatial policy on Galveston Island? And does this local governance arrangement for flood risk reduction favor prevention or spatial planning? To answer these questions, desk research and in-depth interviews with local representatives and experts were combined, the detailed results of which have already been published (Brand, 2015). Considering Galveston's governance arrangement for flood risk reduction, several obstacles exist for a flood defense on or near the beach front, adjacent to the existing sea wall. However, Galveston's planning system also does not seem to offer many options for an alternative flood risk reduction strategy.

Agencies and their jurisdiction

To start with, no local agency has been designated responsible for flood risk reduction, and there is no preferred leading agency. It is thus not surprising that the Ike Dike started as an initiative of Texas A&M University of Galveston. Galveston's governance arrangement for flood risk reduction is composed of a variety of different local agencies, ranging from multiple-purpose authorities (the City of Galveston and Jamaica Beach) to single-purpose authorities (the Galveston Park Board of Trustees) and private non-profit organizations (Galveston Economic Deveop op-ment Partnership) and interest-based associations (the West End Homeowners Association). All the agencies involved in flood risk management do so secondary to their primary aim. The Park Board, for example, safeguards the economic interests of tourism, for which the continued existence of the beach is key. To this end, the Park Board successfully completed two beach nourishment projects in 2015-2016. In order to do so, the Park Board collaborated with the US Army Corps of Engineers, paying the so-called 'incremental costs' to relocate dredge spoils from the Houston Ship Channel to Galveston's beach.

Figure 2.
Galveston Island, West end, after hurricane Ike, 2008 (Photo courtesy FEMA, Jocelyn Augustino)

Figure 3.
Galveston City (Photo courtesy NASA)

The only agency that explicitly mentions safety from flooding in its directives is the Texas General Land Office, a state authority (TGLO, 2014). TGLO allocates funding for projects depending on requests by local partners. But neither TGLO nor the Park Board earmark funding specifically for flood risk reduction projects, which means that new negotiations are required for each project, competing against other funding priorities. The most complicating issue is that jurisdiction on the island is a complex matter. With the exception of Jamaica Beach, which has its own local government, the City of Galveston has jurisdiction over most of the island; for designated sites on 'the dry beach', the responsibility has been outsourced to the Park Board. However, local property owners successfully challenged the so-called rolling easement in 2011, a legal tool that allows mandatory public access to the beach following the vegetation line.

Spatial planning

Although greater Houston is internationally known for its absence of zoning (Lerup, 2011), Galveston City does have some of the basic US planning tools (Berke et al., 2006): a comprehensive plan, land use regulations (LDR), and building codes. For an outsider, it's hard to get a proper understanding of how Galveston's planning system functions - but the preliminary evidence is not reassuring. While spatial planning on Galveston Island does not seem to put constraints on the construction of a flood defense, but it does not promote development that reduces vulnerability either. The LDR and building codes within the city's jurisdiction do not appear to be very effective or up to date. For example, the disturbing findings from the 2004 Galveston Island Geohazard Map (which put much of Galveston's west end in imminent danger of flooding) were never translated into planning policy. To avoid controversy, new land use regulations for beach house construction and dune restoration in the coastal zone were removed from the 'revamped' regulations accepted by the City Council in February 2015.

While integrating water concerns into spatial plans would seem a logical step, this seems hardly to occur in Galveston Island. In fact, lack of integration of spatial plans (or even conflicts) appears to be a systemic problem in the United States in general, undermining the potential to reduce vulnerability to flooding (Berke et al., 2016). In contrast with the Netherlands, where coordination between different spatial plans is mandatory, in the US vertical integration of plans is often lacking. Thus, at first sight, spatial planning in Galveston does not offer ready-made tools to effectively reduce vulnerability to flooding.

The ownership issue

Unlike the Netherlands, where no real debate on property rights exists (Hobma & Schutte-Postma, 2010), these are key to US planning discourse (Berke et al., 2006) and to political debate in Texas (Brand & Hogendoorn, 2015). As mentioned earlier, the jurisdiction of the State of Texas in the form of a rolling easement on the beach has been successfully challenged in court (McLaughlin, 2013). In theory, the Texas General Land Office owns the so-called 'wet beach', an ownership that automatically relocates along with the vegetation line. Now the vegetation line is no longer commonly recognized as the demarcation between private and public property, the TGLO - the only agency that has safety from flooding among its directives and possesses considerable funding - has discontinued nourishment projects on Galveston's west end, as public funds cannot be used to nourish private land. Thus, the agency in Galveston with the most potential to act for flood risk reduction has been sidelined, both in terms of ownership and in competences. Ultimately, TGLO may use its powers of imminent domain to take property for public use in order to construct a flood defense. However, in a state dominated by traditional classical-liberal political values, this is not a very likely scenario.

Concluding remarks

Galveston's governance arrangement for flood risk reduction does not favor prevention, nor does it favor spatial planning. Measures to reduce vulnerability in the built environment face obstacles, as does the construction of a flood defense. However, during the time the MFFD program was involved in Texas, the Ike Dike gathered increasing support (Houston Press, 2016). While the Gulf Coast Community Protection and Recovery District - a six county entity created by former governor Rick Perry in response to Hurricane Ike - has finalized its three-phased report (GCCPRD, 2016), several trajectories for the Ike Dike have been studied (Van Berchum et al., 2016).

Given the ambiguity of ownership along the Texas coast, one of the trajectories focused on raising the existing public road FM 3005 / SH87 along the Gulf-side of the island. Although many issues remain before this can be done - private properties on the bay side will have their view of the ocean impaired, while properties on the Gulf side will remain unprotected - the ownership issue can be avoided. It is possible that the recent ratification of the Water Infrastructure Improvements for the Nation (WIIN) Act and the election of Donald Trump as 45th president of the US in November 2016 may give the flood defense the priority over spatial planning as a flood risk reduction strategy on Galveston Island.

According to Congressman Randy Weber, the passage of the Water Infrastructure Improvements for the Nation (WIIN) Act

> "... includes two provisions that will greatly benefit Texas Congressional District 14 .... The WIIN Act [also] includes language from H.R. 5225, The COAST Act, legislation that I introduced to address concerns regarding the U.S. Army Corps' timeline to complete the Coastal Texas Protection and Restoration Study. It is critical that we expedite the completion of the Army Corps' study that will generate the coastal storm surge protection projects necessary to protect our state against the next big storm. Among the great news for our district, this bill will also provide a solid foundation for President-Elect Trump when addressing the needs of our ports, waterways, and infrastructure in his first 100 days" (statement issued December 12, 2016).

Let's hope so.