Port Cities and Urban Waterfronts
How Localized Planning Ignores Water as Connector
Hein, Carola

DOI
10.1002/wat2.1141
10.1002/wat2.1153

Publication date
2016

Document Version
Final published version

Published in
Wiley Interdisciplinary Reviews: Water

Citation (APA)

Important note
To cite this publication, please use the final published version (if applicable).
Please check the document version above.
Green Open Access added to TU Delft Institutional Repository

‘You share, we take care!’ – Taverne project

https://www.openaccess.nl/en/you-share-we-take-care

Otherwise as indicated in the copyright section: the publisher is the copyright holder of this work and the author uses the Dutch legislation to make this work public.
Overview

Port cities and urban waterfronts: how localized planning ignores water as a connector

Carola Hein*

People have redesigned coastlines, creating ports, shaping waterfronts, and building cities to connect water and land. Specialists from many disciplines have explored the function and design of the water–land transition over many centuries. Among them is planning, a discipline that engages both with the functionality of working ports and the design of the waterfront for the urban public. In order to explore the development of working ports and the revitalization of abandoned inner-city waterfronts since the 1960s, this paper reviews planning and planning history literature in regard to the specific appreciation of water. It first examines the planning of ports and its focus on improving the speed, safety, and logistics, assigning water an industrial role. Second, it reflects on the design of post-industrial waterfront spaces, which ascribes a more aesthetic and symbolic as well as leisure-related role to water. Third, it points to the recent reconnection of cruise shipping with inner-city waterfront redevelopment and the coastline in general. In conclusion, the paper underscores localized perceptions of water in planning literature and the need to recognize how interconnected water systems connect otherwise separated areas along the same coastline. It argues for the integrated planning of port, waterfront, and city in conjunction with a comprehensive study of the environmental and ecological role of water in each of those places, both as a resource they share and, with climate change, a risk to which they must collectively respond. © 2016 Wiley Periodicals, Inc.

INTRODUCTION

Bodies of water, rivers, lakes, seas, and oceans connect distant places and facilitate the movement of goods and people within countries and around the world. They are an important foundation for economic development and a vehicle for globalization. Water transportation facilitates consumption of goods and energy in the contemporary global world, even though fast modes of transportation such as planes, trains, and cars have become available. Tankers, bulk carriers, and container ships play a key role in global trade today, carrying billions of tons of goods (90%) around the world. In the 28 states of the European Union (EU) alone, shipping was above 1.7 billion tons in 2013. Shipping lanes on oceans and seas are relatively malleable, allowing shippers to easily adapt to changing political and economic situations in the foreland, whereas the infrastructure of rivers, canals, railroads, and highways and other roads comprises the relatively fixed hinterland.

Easy access to navigable water, often by way of natural harbors, gave rise to numerous cities on rivers and seas around the world. In many locations, people have redesigned coastlines, creating ports and waterfronts to connect water and land. Located at

*Correspondence to: c.m.hein@tudelft.nl

TU Delft - Architecture, Delft University of Technology, Delft, South Holland, Netherlands

Conflict of interest: The authors have declared no conflicts of interest for this article.
the intersection between water and land, or sea and river transportation, ports provided the necessary facilities—wharfs or quays, piers or jetties, docks and numerous specialized structures—for transshipment of goods and people between domains. Numerous specialists from many disciplines intervened in the creation and transformation of the working port and the waterfront over time. Given geographical, topographical, climatic, economic, political, historical, and other differences, each port city developed its own unique form. Port cities also served as sites of trading headquarters and of living and leisure spaces for traders and other people associated with shipping. Here, people used water in ways beyond transportation—for leisure and to construct local identities and imagery.

Historically, port and city were intimately connected, but with industrialization, the two grew apart. Starting in the 1960s, cities constructed new ports outside their limits to accommodate large container ships; later, they revitalized the inner-city waterfronts that shippers had abandoned. This resulted in the functional separation of industrial shipping in the port from water-related activities for urban populations. Similarly, the people who planned or studied the port were often not in conversation with those who planned or studied the waterfront. Planning-related professions and fields emerged to variously study, redesign, and document port or waterfront urban activities and spaces but rarely both. Though water is the single physical substance that connects these domains (the port and the waterfront), academics and professionals alike treat it very differently in each place.

Following a short introduction to the diverse disciplinary approaches to the study of water in port cities, this article explores planning and planning history literature in regard to two separate spatial entities after 1960: the working ports and the post-industrial waterfront. It explores several foci of planning: first, a willingness to improve the speed, safety, and logistics of the port with the use of water as an agent of industrialization; second, a desire to increase aesthetic and symbolic as well as leisure-related roles of water on the waterfront; and third, the recent reconnection of cruise shipping with inner-city waterfront redevelopment and the coastline in general. In conclusion, the paper highlights recent attempts to plan for port and city in conjunction with each other. It argues that integrated approaches need to coincide with a comprehensive study of the common environmental and ecological role of water in ports, waterfronts, and port cities as a common resource and potential risk.

**DISCiPLINARY APPROACHES TO WATER IN PORT CiTIES**

Water in ports and port cities, its history, presence, and future is a complex topic that includes physical structures, flows of commodities, and people as well as intangible notions of identity creation. Scholars and practitioners from an accordingly broad range of fields have explored it: social scientists (sociologists, economists and geographers); design professionals (engineers, planners and architects); and architectural, urban, and art historians. Each discipline and profession considers water from a different aspect.

The long past of water in ports and cities is mostly a topic for archaeologists and historians. Archaeologists have engaged with port cities, evolving networks, and changing waterways, studying the emergence of cities such as Agade on the Arabian Sea, Piraeus in ancient Greece, and Ostia, the ancient Roman port in the Mediterranean. Historians have followed the flows of water and studied diverse maritime empires on the Arabian Sea, on the Mediterranean, and across the Atlantic; these scholars also track their impact on adjacent ports and cities, which the Australian maritime historian Frank Broeze aptly called ‘Brides of the Sea’. They have focused on religious and ethnic communities in port city networks and the spread of diseases. They have paid attention to water-borne empires, including colonial ones, and their impact on the adjacent ports and cities in war and peace. Historical maps such as those collected in Civitates Orbis Terrarum by Braun Hogenberg from the 16th century and other similar maps document the high degree to which water-based transportation, city construction, and identity formation were intertwined in pre-modern port cities (Figure 1).

Historians have discussed economic, social, cultural, and artistic aspects of water transportation, from crime and lawlessness to religious exchanges, issues of piracy, commerce and migration, multi-ethnic communities, migration, and culture. Numerous historians have studied the evolution of individual ports, occasionally comparing them. They show how ports and cities changed in response to shipping needs. They have also explored the complex relationship of port and city. However, they have rarely discussed the interconnected character of water or its physical quality. The historical accounts do show how, over time, the changing, and sometimes competing, needs and desires of different stakeholders—shippers, port professionals, city power brokers, and citizens—have reshaped water flows and shore lines, port facilities and other water-
related installations, land infrastructure connecting the port and the hinterland, and the architectural and urban structures along its shores.

For every discipline and urban space, water thus has a different significance and quality: mode of transportation, border of the land, place of leisure, or backdrop for urban identity, image creation, and culture. Even though the same body of water links port and waterfront development, a disconnect persists between those who pay attention to port development and those who pay attention to waterfront redevelopment, whether as port professionals or academics. The field of urban planning has been unique insofar as it has engaged both domains, the question of working ports and historic port revitalization. Now, historians studying planning also necessarily discuss both themes—active commercial ports (both containers and bulk) on the outskirts of cities and the revitalization of inner-city ports for urban activities—albeit separately and with differing levels

**FIGURE 1** | Water connects all areas of Amsterdam for transportation and beautification. Woodcut by Cornelis Anthonisz made in 1544 after an oil painting of his own making from 1538. [https://en.wikipedia.org/wiki/Amsterdam#/media/File: Cornelis_anthonisz_vogelvluchtaart_amsterdam.JPG](https://en.wikipedia.org/wiki/Amsterdam#/media/File: Cornelis_anthonisz_vogelvluchtaart_amsterdam.JPG)
of intensity regarding water as the remainder of the article demonstrates.

ONE WATER - MULTIPLE LANDSIDE INTERVENTIONS: MODERNIZING PORTS AND WATERFRONT REVITALIZATION

Controlling water, transforming water, and landside structures of the port was a key to port survival and an issue of national importance. Once rivers and shores became too crowded, rendering transshipment impractical, governments and shipping companies built new docks to control water height despite tidal changes (as in London) and tidal harbors to allow for unloading despite changing river levels\(^25\) (Figure 2). The Report of a Royal Commission established in 1900 to study the administration and facilities of the Port of London found that the port had failed to keep pace with the developments of the population and of commerce and that innovation was necessary, stating ‘We are, however, convinced that if in this great national concern, energy and courage be shown, there is no reason to fear that the welfare of the Port of London will be permanently impaired’\(^26\).

Industrialization in the 19th and 20th centuries led to the creation of monofunctional areas. It brought ever bigger and more specialized ships—sailing ships yielded to steam ships, and multifunctional transporters were superseded by container ships and oil tankers—in turn transforming the ports and related cities to which these ships traveled.\(^27\)

New technologies and means of transshipment—such as bigger cranes but also the construction of railway lines next to the shipping facilities—also pushed cities and shippers into recurrent reconstruction of port facilities. Monofunctional areas for shipping, administration, and housing replaced the formerly integrated multifunctional buildings. Urban rebuilding, such as for the warehouse and later the office district in Hamburg, destroyed the narrow streets of old housing districts, for better and for worse; these had been the sites of major outbreaks of cholera—a water-borne disease to which port cities were particularly prone even as they were also distinctively picturesque.\(^28\)

As ports moved to new locations, often on the outskirts of metropolitan areas, new specialized professions focused on ongoing developments in the port and on the traditional inner-city waterfront, as documented in extensive and different sets of publications. Focusing on ports’ new extra-urban locations, these port professionals, logistics scholars, and economists

---

studied and designed waterways to facilitate shipping, transshipment, and storage.\textsuperscript{29–32} Engineers, managers, and planners were concerned with the design and managements of harbor facilities, with storage sites and diverse water technologies.\textsuperscript{33–36} Meanwhile, upon the departure of the port from traditional waterfronts, many city governments used the opportunity to redevelop the former inner-city ports, taking advantage of water access and historical buildings for the renovation and branding of their cities. They aimed to reconnect people to water and to enhance local identities by celebrating their port histories with water-related events like harbor birthdays, cruise days, and historic sailing ship parades. They made facilities originally destined for port industries into water-related heritage sites or leisure and tourist venues.

Port and city continued to detach until the mid-20th century; the most important split between the two occurred after the 1960s. The following overview of the respective literature on port and waterfront planning since containerization shows that while water as a physical object is present in publications on ports and waterfronts, scholars have focused on disparate characteristics of water, functional and symbolic ones, respectively. In fact, it demonstrates that practitioners and scholars have ignored the role of water as a common facilitator for multiple areas within the city. However, attention to common interests and needs is required for addressing issues of sea-level rise and climate change. As it turns out, the study of planning also reveals that ports and port cities have a long history of responding to water-related disasters including changes in sea-levels, the accumulation of silt, and flooding—a highly relevant topic today that merits further attention, both in terms of historical events and future planning, and one that ought to be discussed throughout for the whole coastline.\textsuperscript{37}

NEW PORTS SINCE THE 1960S: WATER FOR GLOBAL TRANSPORT OF GOODS

Over the last 5 decades, public and private decision makers around the world built new ports and facilities for the increased transshipment of goods and people, responded to similar challenges and opportunities, developed new ports, dredged waterways, transformed storage and transshipment in response to changing ship sizes, new containers, and new commodity flows. They transformed water at an industrial scale.

The construction of new ports on the outskirts of cities that started in the 1960s in conjunction with containerization exemplifies the understanding that water is a facilitator of the transportation of commodities. As numerous scholars have pointed out, containerization led to wholesale restructuring of shipping networks, trade patterns, port facilities, port city hierarchies, and urban form.\textsuperscript{38} However, despite the globally identical catalysts for the creation of new ports and the common role of water, the history of their construction has been dealt with in individual stories rather than as an interconnected story.\textsuperscript{39,40}

Such an integrated story would explore how, from the late 1960s to the late 1970s, ship sizes increased, passing the barrier of 50,000 tons gross, requiring deeper waterways and bigger harbors, and transforming port cities around the world in their wake.\textsuperscript{41} Ships, as global water-borne connectors, require the same conditions and facilities in all ports that wish to host them around the world.\textsuperscript{42} As few ports were able to handle container, oil, and bulk carriers of increasing sizes, city governments, port authorities, and shipping companies from New York to London and Hong Kong developed new terminals on the outskirts where deep water was available to maintain their city’s edge in a tight competition, creating new waterlines with long quays, deep-water berths bordered by cranes, and next to large asphalt-covered surfaces for container storage with good hinterland infrastructure connections. On August 15, 1962, the Port Authority of New York and New Jersey opened Port Elizabeth as the first container terminal.\textsuperscript{43} Another example of the effect of the relocation of cargo facilities is the decline of the Port of San Francisco, which was limited by its existing finger piers and topography, and the rapid development of the Port of Oakland, where the first containership arrived in 1962 and which offered dedicated container facilities and good access to transportation.\textsuperscript{44}

The new facilities would come to resemble each other across the globe, each changing the waterfront of large areas mostly on the outskirts of existing cities. Among the European ports, Rotterdam had historically improved its water connections, notably through the construction of the Nieuwe Waterweg in 1872 from Rotterdam to the sea. It was one of the first ports to receive a container ship, the sea–land container carrier Fairland in 1966, and to adapt its port. Reshaping the Maas River and extending the port towards the sea became a major part of the city’s post-war growth as a global port and transshipment point toward the German industrial areas,
a story that has been discussed by several Dutch authors.\textsuperscript{45-47} The growth of Rotterdam as an oil port notably transformed the river’s path, the water’s edge, and the form and depths of water basins (Figure 3). The success of Rotterdam is also intimately related to its connection by rail and barge to the large inland river container terminal Duisburg, a status that is notably explored in promotional literature.\textsuperscript{d}

As of 2013, Rotterdam held the first place among European ports in container shipping (11th), before Hamburg (15th), Antwerp (16th), or London (107th), all three cities that are located on rivers and limited in regard to the size of ships they can accommodate.\textsuperscript{6} Antwerp, a long-term competitor of Rotterdam, received its first container ship in 1966 and is now receiving oil through pipelines from its Dutch neighbor, replacing water access through land lines.\textsuperscript{48-56} The Hamburg port, including the first container terminal in Hamburg, on Burchardquai opened in 1968 and has extended south of the River Elbe. Several traditional villages had to leave to make room for new container terminals, leaving only a historical church as a reminder of their historical presence (Figures 4 and 5). Today, the container port has become a local scenery and touristic attraction separated from the city by the breadth of water.\textsuperscript{57-63} In Australia, Botany Bay developed in the 1970s some
**FIGURE 4** | HHLA Container terminal. Handling a container ship at the Altenwerder terminal (CTA)
Photo: HHLA. http://hhla.de/en/photos-films/picture-galleries/container/detail.html?tx_otoldnewgallery_pi1%5BshowUid%5D=1393&cHash=5aa4155b082e46f03c6ddd1609034fc

**FIGURE 5** | The Altenwerder Church, the only reminder of the historic village replaced by the container port expansion. Photo: Jolan Dhuique-Hein.
10 km south of the city center. Here, as in many other locations, the government and other powerful entities behind the construction largely disregarded the communities already living where the container terminals would be built. On the Thames River, the Tilbury docks that served the London port and originated in 1886 were restructured for container service by 1970. A new deep-water terminal, London Gateway in Thurrock, Essex, is under construction even further from the city center. While located on the same river, the site will be largely under the control of authorities other than the city and thus also beyond the reach of plans by the Mayor of London to ensure that the city’s future development meets new criteria of sustainability and social equity.

Just as governments and other actors ignored the people in the way of the terminals, they disregarded questions of water quality, waste management, ecology, and heritage structures and landscapes. Economic growth and improving the connection to the water took precedence in these big port cities, a central, shared goal that becomes visible when we look at the literature comparatively. While ample planning-related publications exist on each location, writings that study the port and water-related developments in a metropolitan or regional context appear to be missing.

Thanks to the adaptations of diverse bodies of water, to coastline transformation and new port constructions, and to urban adaptations, global maritime traffic flows have facilitated the increase of global production and consumption patterns. Global trade is visible in the huge amount of containers that circle the earth as well as in urban growth. The World Bank counted a little over 651,000,000 transshipments of 20-foot container units in 2013. The leading container ports are now located in Asia and the Middle East, and the huge ships that dock there connect to Europe and America. New ports have notably emerged in China, where many goods originate and where leaders since the 1970s have emphasized the growth of ports. A look at economic statistics on leading global ports published by the American Association of Port Authorities (AAPA) in 2013 shows Singapore and Shanghai as ranking respectively first and second in terms of twenty-foot equivalent unit (TEU) and total cargo volume—at least partly a result of their particular water access. They are followed by several other Asian, mostly Chinese, cities. These flows of goods carried by container on water are in addition to the enormous flows of bulk goods, such as petroleum and its products (1800 million metric tons in 2014 in crude oil), carried by ships.

Increasing ship sizes require deeper waterways or ports that are built into the sea, further illustrating the industrial dimension and engineering of water in ports and the common catalysts shaping far-flung locations. Deep-water ports are defined as ports that can accommodate the largest ship that can cross the Panama Canal’s locks, so-called Panamax ships. New deep-water ports have been constructed, for example, in China, such as the Yangshan deep-water port near Shanghai that is connected to land over the new Donghai Bridge, which is more than 30 km (18.6 miles) long. It hosts a gigantic container terminal on a man-made area between two islands. To benefit from economies of scale, traders keep ordering bigger ships, pushing the deepening of ports and waterways and the raising of bridges in Miami, New York, Seattle, and other cities around the world. With the completion of the Panama Canal expansion expected in 2016, even bigger ships, the so-called Super Panamax ships, will require many cities to rework their ports; discussions about the changes required are already underway in port cities on the American east coast, such as Savannah, Georgia.

Bodies of water are also intimately related to the global exchange of energy, notably of petroleum products. Again, research on individual cities abounds, but comprehensive studies of the interrelation of planning for oil ports and the role of water therein are missing. A comprehensive history would consider the numerous new ports developed for oil shipping. The development of Rotterdam from 1862 until today reflects the ubiquitous growth of petroleum storage, refining, and transport particularly well (see Fig. 3). Another example of oil-related port redevelopment is Port Harcourt after 1958 in Nigeria. Oil income led the Nigerian government to conceive and construct the new inland capital city, Abuja, and the oil economy triggered the growth of the port of Lagos through which consumer goods and raw materials entered the country.

Petroleum shipping transforms cities around the world, but so far, little attention has been given to these networked changes in places with and without oil. Petroleum has redesigned places on strategic water sites even in the absence of oil sources, as evidenced through the emergence of Singapore as an oil hub. Thanks to its location near one of the choke points in global shipping, the Malakka Straits; its political status as a former British colony; and its reputation as a small city-state with friendly relations to its Asian neighbors, Singapore has become a major oil hub after the construction of Singapore’s first oil refinery on Pulau Bukom in 1961. However, the local
availability of oil and the possibility of selling it around the world was a major criterion in the design of Jebel Ali in Dubai. The sheik used foreign ideas and consultants for engineering, planning, and architecture (including concepts for company towns) to reinvent and re-imagine the port city at an unprecedented new scale.73,74 A deep-water port for oil transport notably exists in Louisiana. The Louisiana Offshore Oil Port serves supertankers since 1981 and is located in the Gulf of Mexico, southeast of Port Fourchon. While pipelines carry oil from Russia to Europe or from Canada to the United States, water transportation provides more flexibility, and traveling on the oceans is cheaper than flying over them. The emergence of new oil ports suggests that global oil flows continue to be carried by water. New waters will open as the sea ice melts, and the possibility of new shipping lanes will create numerous political challenges that are already in the news. Climate change and rising waters are already changing some port cities, yet another common theme that merits comparative investigation.

WATERFRONT REVITALIZATION AND WATER AS LEISURE AND IDENTITY

Meanwhile, New York, Hamburg, Amsterdam, Philadelphia, and Sydney lost their identity as global ports. If new ports were booming in similar ways, it was because shippers and other stakeholders had abandoned older ports, which now suffered in common. The old waterfronts became ghost districts, challenges to urban development. Filled with industrial structures, including refineries and waste, these sites were often connected to polluted waters and needed major investment for redevelopment. Many cities had to develop new strategies for these now-empty inner-city ports and for the many people who had lost their jobs in packaging, transportation, and storage. This planned restructuring of traditional waterfronts occurred almost simultaneously around the world and is studied extensively, mostly through individual cases, and only a few publications can be mentioned here to suggest the larger picture.75–81

Waterfront (re)development emerged as an anchor project for urban redevelopment—whether focused on business, leisure, or multifunctional development—as models of regeneration of brownfield areas, with a special heritage appeal through the preservation and reinterpretation of traditional port infrastructure and the reuse of the water for locals. Local presses have often touted these revitalizations, celebrating water for its aesthetic appeal to residents and tourists, that is, as a setting or background—the long views it provides, the promenades along its sides, the approach across it toward new construction. They celebrate the history of the site through the preservation of heritage buildings, discussions about the design and events of the public spaces, and occasional events and uses of the water, such as for heritage ships, ferry landings, pleasure cruising, cruise ship events, harbor birthdays or other water-based celebrations such as Baltic Sail, a maritime festival around the Baltic Sea. Aquariums in several cities, Baltimore, Osaka, or Genova, add a touristic and educational component linked to water and the local environment (Figure 6). Water quality, or the recreation of local marine habitats or water systems, appears mainly when they contribute to the use of the site. Water quality issues may mean cleanup of oil spills and other industrial waste as the case of the Newtown Creek waterfront suggests: here, 17–30 million gallons spilled from historic refineries. While projects such as the river revitalization of the Cheonggyecheon in Seoul also have tactile qualities, those are less relevant for seaport cities, where the river is less accessible and not made available for play or swimming.82

A large number of former seaports have remade their inner-city waterfronts; the literature on these transformations mostly deals with individual cities. It is so extensive that only a few sources can be indicated here.83–90 Inner-city waterfront transformations in North America and Europe include Baltimore, New York, Vancouver, Boston, Portland, Seattle, Miami, London, Hamburg, Barcelona, Genova, Lisbon, Sevilla, Helsinki Bilbao, Liverpool, and Dublin to mention just some. In Asia, Shanghai, Sydney, Osaka, and Melbourne stand out.

The celebratory character of much of this literature is balanced by a few commentaries that speak to the socioeconomic issues associated with urban renewal of a waterfront area and the impact of that work on the city as a whole. Thus, researchers have studied Baltimore as the model for waterfront regeneration around the world; they have also considered its impact (or the lack thereof) on the city as a whole.91 The revitalization of the Docklands in London has similarly seen celebratory and critical scholarship.92–98 Scholars occasionally raise questions about socioeconomic transformation beyond physical ones and the role of social justice or the commodification of historical heritage, often in response to the redevelopment of waterfronts as part
of exhibitions or mega-events, as in Sevilla (1992), Barcelona (1992 and 2004), Genova (1992 and 2004), Lisbon (1998), and Hamburg (2013–15) and even in applications to host such events such as in Hamburg for the Olympics.89,99–101

However, there are new waterfront adaptations beyond Baltimore and established European, American, or Australian models. Abu Dhabi, Saudi Arabia, Quatar, and Manama are imagining and building entirely new waterfronts, focused on upscale housing, tourism, culture, and leisure activities, on land reclaimed freshly for this purpose. The palm islands in Dubai, for example, resemble other artificial islands, such as Port Island and Rokko Island in Kobe, built in the 1960s to provide new port functions, housing, an amusement park, and sport facilities.102 Similar land reclamation projects in the Tokyo Bay, in Hong Kong, and other cities provided space for new developments, including housing and a multitude of business, commercial, and cultural functions. Occasionally, cities have renaturalized areas such as the Kasai Rinkai Koen, the largest park in central Tokyo and located close to Tokyo Disneyland, on reclaimed waterfront land. The area aims to recall the natural habitat of Tokyo Bay, and the Tokyo Sea Life aquarium located in the park features aquatic habitats from Tokyo and the world. The Marina Bay redevelopment in Singapore on reclaimed land is yet another facet of waterfront redevelopment. The annual revenue from oil and gas affords the Gulf countries a financial foundation from which to reform their local economies, rebuild cities, and invent new urban futures. The financial crisis and the falling oil prices have slowed down some of the ambitious projects, such as the one for Masdar near Abu Dhabi, designed by Foster & Partners and originally projected as a zero-energy and zero-waste city.103 Saudi Arabia, the world’s single largest supplier of oil similarly plans to use oil profits to construct six several economic cities.104 One of these, the King Abdullah Economic City, is planned to expand over some 181 sqkm (70 sq miles); but only 15 percent have been built so far.105

Waterfronts have been built and rebuilt over centuries for shipping and for leisurely purposes, and they continue to attract investments. Particularly locations facing the sea, with their impregnable views, are among the most appreciated real-estate sites. Engineers, elites, and citizens have long gained experience in controlling and orienting water and developing new technologies; contemporary interventions occur mostly independently from each other and do not consider water as an encompassing entity. Questions of animal and plant life in the rivers and oceans around ports and urban waterfronts are only receiving passing attention, even though such discussions occur regularly regarding waterfronts in natural or vacation sites.106

RECONNECTING PORT AND WATERFRONT: WATER FOR PLEASURE CRUISES

Water transportation today is not only about efficient and economic movement of goods in containers or in bulk but also about bringing people to new places, including revitalized waterfronts. People continue to travel by ship, for example, on ferries connecting islands within one nation or crossing the Baltic and other seas for daily life purposes (including migration). Additionally, the number of people traveling for pleasure on cruise ships grows steadily. What was traditionally a pastime for the wealthy has become a mass adventure. Before World War I, at a time when the Hamburg-based Hapag shipping company conveyed millions of immigrants from Europe to America, its director Albert Ballin was developing the first custom-build cruise ships. Its draw grew steadily until World War II, which meant a suspension of such activities.

By the 1980s, when waterfront revitalization was expanding, cruising was starting to pick up again. Revitalized waterfronts and events provide the necessary attractions for tourism. In turn, the ships bring port activity back to the formerly abandoned central city sites, with all the environmental and social challenges that such activity entails. Their arrival also provokes questions of gentrification and inequality as old working ports with diverse populations have given way to housing, parks, leisure, and travel for the relatively wealthy.

Over the last decade, growing numbers of people have vacationed on cruise ships, taking advantage of water transportation and enjoying water as a background to their tourist experience, albeit often with little interest in its environmental quality. The new cruise ships are at the scale of large skyscrapers. The construction of the Queen Mary II in 2003 ushered in a new age of truly gigantic cruise ships, including the Royal Caribbean Oasis and its sister ship the Allure; at 225,000 tons and 1188 feet; these cruise ships are more akin to tankers and container ships than to the pleasure ships of the past. The Allure can host nearly 6,300 passengers and a staff of almost 2400 crewmembers and offers amenities from a shopping mall to a water park, from a zip wire to Broadway-style shows. Also over the last decade, the number of cruise ship tourists has risen steadily, and cruise tourism has developed into a form of mass tourism. In 2012, American cruise ships carried some 17 million passengers on fully catered vacations and tours to exotic locations.107 Many of these cruises take advantage of another facet of water in cities: waterfront revitalization and water as leisure and identity-producing sites108 (Figure 7). The impact of cruise ships on cities such as Venice is highly contested but is yet to be fully studied.

FIGURE 7 | View of the HafenCity Hamburg with a cruise ship and the working port visible across the river Elbe. Copyright: Carola Hein.
These new cruises require extensive facilities, and the number of terminals has grown rapidly in recent years.

The effects of cruise shipping goes beyond that of industrial shipping of commodities as the quality of the site of arrival, its urban, or rural aspects matter to the paying passengers. Environmental aspects such as water quality therefore take on new meaning. The link between cruise shipping and water quality and the environment is evident, even though it has yet to fully enter into planning practice. Activists criticize the cruise-shipping industry’s use of heavy oil and unfiltered sulphurous gasoline, both environmentally disastrous and dangerous to the health of urban inhabitants. Several bills have been brought before the US Senate to enact national standards requiring that waste water generated by cruise ships be treated, but none have actually been passed. However, catering to the cruise ship industry and ignoring ecological damage may backfire in the long run. For example, the loss of ice in the Hudson Bay might curtail cruise shipping. Many tourists are taking the ship to the bay to look for ice-based wildlife; if the ice retreats (because of climate change caused in part by the ships themselves), the wildlife may move further north, and cruise ships may ignore the port. Culture and nature are largely commodified as part of the cruising experience, but questions of social justice and ecology related to cruising have yet to be fully discussed in the literature.

So far, planners for port authorities and municipalities have treated their water-related properties separately, for industrial and shipping purposes on the one hand and those for urban leisure activities on the other. Yet the creation of new ports on waterways is a key element of globalization and economic growth as it supports the international distribution of commodities and energy. Paradoxically, the global economy and consumption that containerization fosters also contribute to global climate change and rising water levels that particularly threaten many if not all ports and their cities. A few scholars and organizations are honing in on the missing relationship between port and city planning. The Association Internationale Ville et Port (AVIP) and The Asociación para la Colaboración entre Puertos y Ciudades/Association for the Collaboration between Ports and Cities (RETE) promote the comprehensive planning of port and city through publications and conferences. The need to respond to issues of rising water levels and climate change, highlighted also through the flooding of New Orleans after Hurricane Katrina in 2005, has also attracted interest from the Museum of Modern Art in New York, which examined it in regard to New York (Figure 9). Nonetheless, a broad, global investigation of economic, social, cultural, ecological, and environmental aspects is missing.

CONCLUSION

Even though water is a shared resource and key characteristic of both port and waterfront design, its
physical character, its ecological and environmental quality, receive only passing attention in the scholarly literature except in regard to pollution. Despite the interconnectedness of ports and waterfronts, or the more recent intersection between cruise ships and inner-city ports, there are few studies that engage the urban uses of water from a comprehensive perspective and tie the different urban bodies of water, rivers, lakes, or the sea, into local urban planning. Furthermore, despite the shared challenges of water that threaten port cities around the world, collective responses are so far absent.

The challenges of global water rise will require ingenuity around the world. Port cities and urban waterfronts are at the forefront of these changes. So far, scholars have paid only limited attention to bringing an urban planning perspective to bear on ports, port cities, and waterfronts that are located on single bodies of water, such as the North Sea, the Baltic Sea, or the Mediterranean Sea. Hurricane Sandy provided a first taste of the potential dangers and challenges of flooding. New plans and planning coalitions between ports, cities, and neighboring regions, both along the shore and towards the hinterland, may be necessary to address this challenge.

Academic research on ports and waterfronts has focused on isolated aspects of port engineering or management or on the urban potential of water proximity. More research needs to be conducted to find a common perspective on future challenges, notably towards environmental risks such as rising water levels and urban flooding due to climate change. Heritage themes and sustainability on coastlines is another important theme and one that the EU wishes to address in a 2017 call. New flood defences (unbreakable dykes, swimming cities) appear to be solutions that are raised locally and by cities with appropriate means. Some ports try to position themselves as so-called GreenPorts that balance economic and environmental challenges. Responsible innovation has become a theme, for example, for the Rotterdam port, which reduces fees for ships that have won the Green Award. However, despite recent attempts at global policies on pollution, no planning responses have yet emerged.
Economic and other factors remain the main drivers of port and waterfront planning. A novel recognition of interconnected water systems, of connections between dredging the port and the need for infill to shore up the coasts, and the construction of so-called unbreakable dikes, or super-dikes, seems disconnected from planning literature. Scholarly discussion of mixed-use waterfront landscapes around historic port cities and new ports may help planners and others reconsider the relationships between cities and water. An integrated perspective on the context of the city and its hinterland, acknowledging the water as a shared resource and challenge—as a physical, economic, social, cultural and also environmental and ecological element—might help us develop common responses to contemporary challenges.

NOTES


g Container port traffic http://data.worldbank.org/indicator/LS.SHP.GOOD.TU/countries/1W?display=map


i The nature of Cities, Cities are ecosystems of people, nature, and infrastructure http://www.thenatureofcities.com/2015/01/06/urban-water-fronts-have-typically-been-sites-of-heavy-development-and-often-are-sites-of-pollution-or-exclusive-access-but-they-have-enormous-potential-benefits-how-can-we-unlock-these-benefits-for/


k Green Port, http://www.greenport.com/home


REFERENCES


22. Hoyle BS. *Cityports: Coastal Zones and Regional Change*. Chichester: John Wiley & Sons Ltd; 1996.


73. Ramos SJ. *Dubai Amplified (Design and the Built Environment)*. Ashgate: Aldershot; 2010.


81. Schubert D. ‘Ever-changing waterfronts’: urban development and transformation processes in ports and waterfront zones in Singapore, Hong Kong and Shanghai. In: Graf A, Huat CB, eds. *Port Cities in...*
94. Brownill S. Selling the inner city: regeneration and
93. Brownill S. Dockland: origins and earlier history. In:
89. Carnevali G, Delbene G, Patteeuw V, eds.
88. Dovey K.
87. Aprioku IM. Local planning and public participation:
86. Sepe M. Urban history and cultural resources in
85. Hoyle BS. Urban waterfront revitalization in develop-
84. Brown PH. Docklands. Cultures in Con
83. Bone K, Bone E, Betts MB.
82. Busquets J, ed. Deconstruction/Construction: The
81. Deconstruction/Construction: The Deconstruction/Construction: The
80. WIREs Water
79. WIREs Water Port cities and urban waterfronts
78. WIREs Water Port cities and urban waterfronts
77. WIREs Water Port cities and urban waterfronts
76. WIREs Water Port cities and urban waterfronts
75. WIREs Water Port cities and urban waterfronts
74. WIREs Water Port cities and urban waterfronts
73. WIREs Water Port cities and urban waterfronts
72. WIREs Water Port cities and urban waterfronts
71. WIREs Water Port cities and urban waterfronts
70. WIREs Water Port cities and urban waterfronts
69. WIREs Water Port cities and urban waterfronts
68. WIREs Water Port cities and urban waterfronts
67. WIREs Water Port cities and urban waterfronts
66. WIREs Water Port cities and urban waterfronts
65. WIREs Water Port cities and urban waterfronts
64. WIREs Water Port cities and urban waterfronts
63. WIREs Water Port cities and urban waterfronts
62. WIREs Water Port cities and urban waterfronts
61. WIREs Water Port cities and urban waterfronts
60. WIREs Water Port cities and urban waterfronts
59. WIREs Water Port cities and urban waterfronts
58. WIREs Water Port cities and urban waterfronts
57. WIREs Water Port cities and urban waterfronts
56. WIREs Water Port cities and urban waterfronts
55. WIREs Water Port cities and urban waterfronts
54. WIREs Water Port cities and urban waterfronts
53. WIREs Water Port cities and urban waterfronts
52. WIREs Water Port cities and urban waterfronts
51. WIREs Water Port cities and urban waterfronts
50. WIREs Water Port cities and urban waterfronts
49. WIREs Water Port cities and urban waterfronts
48. WIREs Water Port cities and urban waterfronts
47. WIREs Water Port cities and urban waterfronts
46. WIREs Water Port cities and urban waterfronts
45. WIREs Water Port cities and urban waterfronts
44. WIREs Water Port cities and urban waterfronts
43. WIREs Water Port cities and urban waterfronts
42. WIREs Water Port cities and urban waterfronts
41. WIREs Water Port cities and urban waterfronts
40. WIREs Water Port cities and urban waterfronts
39. WIREs Water Port cities and urban waterfronts
38. WIREs Water Port cities and urban waterfronts
37. WIREs Water Port cities and urban waterfronts
36. WIREs Water Port cities and urban waterfronts
35. WIREs Water Port cities and urban waterfronts
34. WIREs Water Port cities and urban waterfronts
33. WIREs Water Port cities and urban waterfronts
32. WIREs Water Port cities and urban waterfronts
31. WIREs Water Port cities and urban waterfronts
30. WIREs Water Port cities and urban waterfronts
29. WIREs Water Port cities and urban waterfronts
28. WIREs Water Port cities and urban waterfronts
27. WIREs Water Port cities and urban waterfronts
26. WIREs Water Port cities and urban waterfronts
25. WIREs Water Port cities and urban waterfronts
24. WIREs Water Port cities and urban waterfronts
23. WIREs Water Port cities and urban waterfronts
22. WIREs Water Port cities and urban waterfronts
21. WIREs Water Port cities and urban waterfronts
20. WIREs Water Port cities and urban waterfronts
19. WIREs Water Port cities and urban waterfronts
18. WIREs Water Port cities and urban waterfronts
17. WIREs Water Port cities and urban waterfronts
16. WIREs Water Port cities and urban waterfronts
15. WIREs Water Port cities and urban waterfronts
14. WIREs Water Port cities and urban waterfronts
13. WIREs Water Port cities and urban waterfronts
12. WIREs Water Port cities and urban waterfronts
11. WIREs Water Port cities and urban waterfronts
10. WIREs Water Port cities and urban waterfronts
9. WIREs Water Port cities and urban waterfronts
8. WIREs Water Port cities and urban waterfronts
7. WIREs Water Port cities and urban waterfronts
6. WIREs Water Port cities and urban waterfronts
5. WIREs Water Port cities and urban waterfronts
4. WIREs Water Port cities and urban waterfronts
3. WIREs Water Port cities and urban waterfronts
2. WIREs Water Port cities and urban waterfronts
1. WIREs Water Port cities and urban waterfronts


