



## ISSUE BRIEF



# REVITALIZING THE CHICAGO AREA WATERWAY SYSTEM: KEY TO A HEALTHY, VITAL, SUSTAINABLE GREATER CHICAGO

Waterways hold the potential to relieve stress on roads and rail by shouldering some of the freight load from trucks and railroads while reducing greenhouse gases and other pollution. But not all waterways are created equal, and major urban centers must decide how to use their waterways given their structural conditions, operational constraints, ecological role, and functional potential as well as the needs of the population.

Chicago, in particular, must take a hard look at the current state of its inland waterways, known collectively as the Chicago Area Waterway System (CAWS), and determine how these rivers and canals can best serve its residents and other stakeholders, with an eye to the future. And the time to do so is now: Asian carp and other destructive aquatic invasive species (AIS) are using the CAWS as a highway between the Great Lakes and Mississippi River. In addition, the CAWS continues to function as an outlet to Chicago's aging and crumbling sewer system, receiving

untreated sewage, failing to meet the standards of the Clean Water Act, and adversely affecting the people, property and environment in Chicago, the Great Lakes and the Mississippi watershed. The physical configuration of the CAWS also constrains the movement of shipping, compromising its role in the economy. Given the threats to the Great Lakes and Mississippi River, as well as the Greater Chicago population, what to do with the CAWS is not a pressing question simply for the city, but for the nation.

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To aid in this effort, NRDC retained Cambridge Systematics (CS), a leading transportation consulting firm, to assess two important factors: commercial shipping on the CAWS and land use visions for areas around the upper CAWS.<sup>1</sup> We then surveyed the compliance histories of businesses located on the Calumet River, along a major industrial corridor of the CAWS.

Together these analyses show the following:

- Commercial shipping tonnage on the CAWS has been in decline since the 1990s, and it is expected that, without action, truck and rail will carry an increasing portion of freight tonnage in the coming decades.
- Little tonnage moves *between* the Great Lakes and the Mississippi River via the upper CAWS. Freight tonnage on the CAWS is higher on the West part of the CAWS as the waterway travels toward the Mississippi River, and on the Calumet River near Lake Michigan, but at most about a quarter to a third of total CAWS traffic is *through* traffic.
- Coal and petroleum coke shipping on the upper CAWS has been declining and is likely to continue to decline.
- The Illinois River is increasingly being used to ship grain, but the growth in this market is expected to occur south of Lockport on the CAWS.
- The CAWS infrastructure is crumbling and funds for mere repair—let alone to fix key system components—are lacking, and the system has inherent physical restrictions that constrain shipping.
- Current efforts to modernize commercial shipping in the region focus on rail and highway modes, virtually ignoring the CAWS as part of the modern goods movement system.
- A number of businesses along the CAWS or that use the CAWS for shipping have been cited for violating current health and environmental standards, and likely are not using modern best management practices and controls for pollution.

- The city and communities along the CAWS envision the waterways as multi-dimensional assets at the heart of revitalized urban neighborhoods, not solely as shipping or sewage conduits.

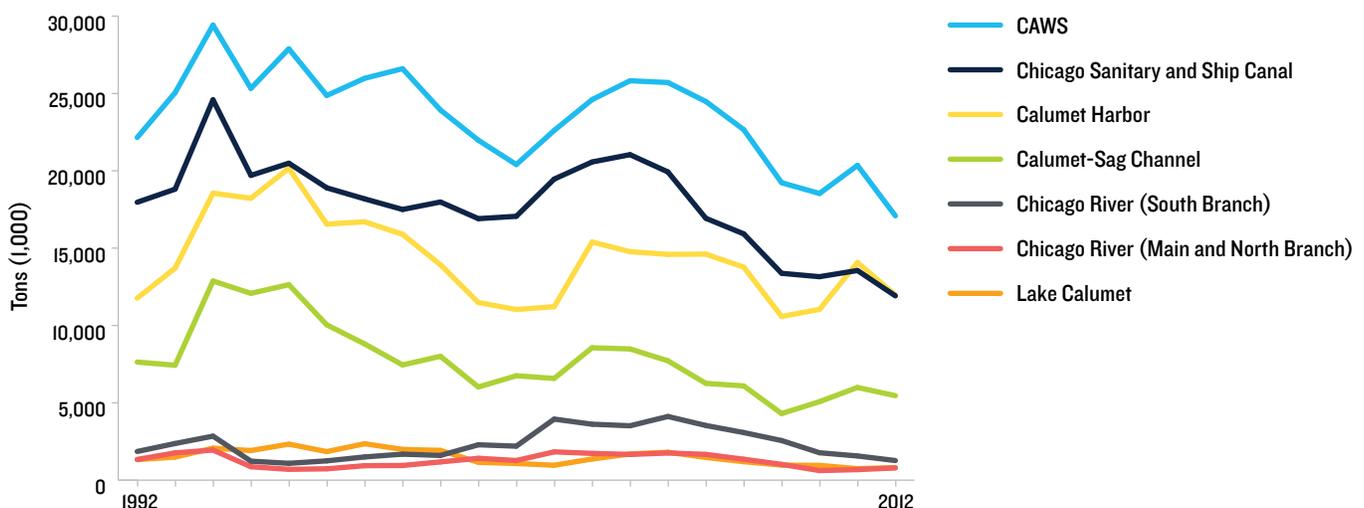
Based on these findings and the advancing threat of AIS, business-as-usual and short-term, temporary “fixes on failure” are not enough to create useful, modern waterways that serve our economy while protecting our urban communities and our nation’s treasured water bodies.

NRDC’s recommendations include:

- A detailed, multimodal assessment of and future vision for freight infrastructure and operations that approach the CAWS as part of the regional and national goods movement system, while reducing the impacts of freight movement on residential communities.
- Effective application and enforcement of existing public health and environmental laws and policies for businesses using the CAWS.
- Updated health and environmental standards, policies, and practices that reflect modern best management practices and controls.
- A revised land use plan that can draw clean, sustainable business to ground community renewal.

Together, these steps can help ensure that businesses get the materials they need and, in exchange, act as good neighbors. They can also enable the region and nation to move toward the best solution to the AIS threat by identifying which goods truly need to move on the CAWS through AIS control points and engineering solutions for making sure they can do so. Absent a systematic commitment to re-envision the CAWS as a vital urban, commercial, and environmentally sound water resource, it will continue to decay and decline into an ever more marginal backwater, burdening the economy, environment, and quality of life of Chicago, the Great Lakes and the Mississippi Watershed.

**FIGURE 1: CAWS USAGE BY SEGMENT (1992 – 2012)**



## A BRIEF HISTORY OF THE CAWS

The Chicago Area Waterway System consists of more than 100 miles of rivers and canals between Lake Michigan and the Mississippi River. This includes the Chicago River, Chicago Sanitary and Ship Canal, Cal-Sag Channel, and the Grand and Little Calumet Rivers. In the 19th century, portions of the system were engineered to reverse the Chicago River to avoid sending Chicago's sewage directly

into the Great Lakes and thus contaminating the City's drinking water source.<sup>2</sup> The sewage was instead sent down the Mississippi River, and has contributed to the dead zone in the Gulf of Mexico.<sup>3</sup> These engineered canals also contributed to Chicago's early economic rise by moving goods to new manufacturing businesses.<sup>4</sup> The CAWS's role in shipping, however, was soon eclipsed by the railroads.<sup>5</sup>



The CAWS is a highway for aquatic invasive species along with sewage and other contaminants. The year 2015 was a banner year for Asian carp movement through the CAWS toward Lake Michigan, with juvenile carp found 33 miles further upstream than in previous years.<sup>6</sup> The time to stem this flow is now.

Awareness of the CAWS's role in spreading AIS rose in the 1980s and 1990s, when destructive zebra and quagga mussels, believed to have been introduced to the Great Lakes from Europe via ship ballast, began showing up in the Midwest's major river systems.<sup>7</sup> Around the same time, heavy flooding of the Mississippi River led to escape of Asian carp from fish farms and their migration into the Missouri and Illinois Rivers.<sup>8</sup> The U.S. Army Corps of Engineers responded in 2002 by building an electric barrier 25 miles from Chicago to protect Lake Michigan from advancing carp. Five years later, with concerns about the barrier's effectiveness and fears of a carp invasion of the Great Lakes growing, Congress called for the U.S. Army Corps of Engineers to study means for preventing transfer of AIS between the Great Lakes and Mississippi River Basins.<sup>9</sup>

The Army Corps released its Great Lakes and Mississippi River Interbasin Study (GLMRIS) in 2014. The report identifies scud and two species of carp threatening the Great Lakes, and another 10 aquatic invasive species, including bloody red shrimp and fishhook waterfleas, threatening the Mississippi River.<sup>10</sup> These species “can threaten native plants and animals; reduce abundance and variety of native species; harm important terrestrial and aquatic ecosystems; degrade water quality; transport diseases; and result in economic, political, and social impacts.”<sup>11</sup> The Aquatic Nuisance Species Task Force estimates that the 15 most recent introductions of invaders could cost the United States \$134 billion by 2050.<sup>12</sup>

While ongoing measures like the electric barrier and netting fish may reduce the risk of Asian carp invading the Great Lakes to some degree, and additional measures like chemical treatment may do the same for invasive plant species moving towards the Mississippi, these measures do not adequately protect both basins from a full range of aquatic invasive species. The GLMRIS report finds that hydrologically separating the two basins—returning them to their natural flows via barriers in the CAWS— is the most effective means to prevent interbasin transfer.<sup>13</sup> This is because separation works on all species in both directions.



### **SHIPPING ON THE CAWS: IN DECLINE SINCE 1990S**

Waterborne shipping in recent years has accounted for only about 3 to 4 percent of total tonnage and 0.3 percent of freight value moving through the Greater Chicago region.<sup>14</sup> In fact, shipping via the CAWS has declined nearly 40 percent from about 29 million tons in the most heavily trafficked point in 1994 to less than 17 million tons in 2012.<sup>15</sup>

The tonnage moving through the points on the CAWS potentially impacted by barriers or locks for AIS control—near Stickney on the Sanitary and Ship Canal and Alsip, Illinois on the Cal-Sag Channel or the T.J. O'Brien lock near Lake Calumet, under current stakeholder discussions—is smaller than the downstream tonnages using the waterway.<sup>16</sup> Moreover, shipping on the upper CAWS appears to be dropping at a greater rate than on other regional and state waterways.<sup>17</sup> Nor does the CAWS enable a robust flow of goods from the St. Lawrence Seaway and Great Lakes to the Mississippi River and vice versa, as was once envisioned. Instead, the majority of goods moving from the Mississippi Basin on the CAWS stops short of the Lake Michigan shoreline, not entering the Great Lakes. Alternately goods moving from Lake Michigan remain along the shoreline or in the Lake Calumet area, and do not proceed further along the CAWS.<sup>18</sup>

Looking forward, significant decline in the shipping of coal and petroleum coke—which was in pre-recession 2008 the leading commodity group on the CAWS, accounting for

about a quarter of total traffic<sup>19</sup>—on the CAWS is likely, as discussed in detail below.<sup>20</sup> At the same time, growth in grain shipping on the Chicago Region’s inland waterways is projected to occur south of the CAWS, and thus is unlikely to be impacted by AIS controls further north in the CAWS.<sup>21</sup> The upper CAWS will continue to serve an important role bringing materials like sand and gravel to construction-related businesses, and shipping out scrap metal from recyclers.

## **CRUMBLING WATERWAYS INFRASTRUCTURE: LACK OF INVESTMENT AND INHERENT CONSTRAINTS**

Current investment in the nationwide inland waterway system is minimal, and the CAWS is no exception. Costs of major rehabilitation projects, operations and maintenance are largely borne by the federal government, thus putting most of the system’s cost on taxpayers.<sup>22</sup> A user tax on commercial barge fuel has yielded little funding for major rehabilitation projects through the Inland Waterways Trust Fund, due in part to decreased revenue from low use of waterways to move goods.<sup>23</sup> Congress increased the tax in December 2014, urged by users themselves. However, the increase is expected to generate only modest funds for a massive list of backlogged projects estimated to cost billions of dollars.<sup>24</sup>

Thus, it is not surprising that the locks and dams on the CAWS are in a decayed, dilapidated state. The CAWS’s five locks and dams are antiquated, and the youngest facility is more than 50 years old. The U.S. Army Corps of Engineers has generated a long list of repairs needed to keep these facilities running, few of which have been proposed for funding, let alone actually approved and undertaken. The remaining repairs are reliant on the modest, backlogged funds of the Inland Waterways Trust Fund.<sup>25</sup> Even assuming that funds are available to fix the locks, the CAWS suffers from congested and narrow portions, low overhead bridges, and water draw-downs—all of which are chokepoints that limit shipping and resiliency.<sup>26</sup>

## **CHICAGO REGION’S FREIGHT TRANSPORTATION SYSTEM: WATER OMITTED FROM RAIL AND TRUCK PLANNING**

While the upper CAWS is an important resource for a handful of companies, it has been largely left out of critical discussions about the future of shipping in Chicago. The region is spending billions of dollars on its rail and truck infrastructure, and none of the major freight plans and initiatives give any significant time or thought to the CAWS.<sup>27</sup> The result is a waterway system that continues to fall behind and lacks connectivity to the dominant transportation infrastructure and economy.<sup>28</sup>

That said, interest in the CAWS among state and regional freight planners has piqued somewhat in the past several years, as the federal government plans for the national marine highway system. In 2010, CAWS and shipping stakeholders participated in a planning survey about the region’s inland waterways. The CAWS received low marks



from participants across the board, with respondents citing poor lock reliability, inadequate dredging, and chokepoints as key challenges.<sup>29</sup> Ranked against truck and rail counterparts, 20 public sector and 30 private sector respondents rated the waterway system as lowest in meeting their needs.<sup>30</sup> Participants embraced a system with improved connectivity to truck and rail, more investment in efficient infrastructure, and regular facility maintenance. Yet despite these findings, five years later no comprehensive planning process has been initiated to address these concerns, let alone generated an actual plan. Meanwhile, truck and rail planning and investments have continued to move forward.

## **HEALTH AND ENVIRONMENTAL COMPLIANCE FAILURES**

NRDC reviewed compliance and enforcement histories of facilities along the Calumet waterways and served by barges. We found that, while significant strides have been made, a number of today’s facilities along the Calumet corridor have been cited for operating in violation of numerous health, safety and environmental laws, burdening communities and the environment, based on citations and enforcement actions by the U.S. Environmental Protection Agency (EPA), Illinois Attorney General, Illinois EPA, and the City of Chicago.

In the summer of 2013, black clouds of dust blew from the direction of sites handling petroleum coke and coal in huge open piles. Following community outcry, the City of Chicago, Illinois Attorney General, Illinois EPA, and U.S. EPA took a number of steps to reduce the pollution from these types of sites, including filing lawsuits, adopting regulations, and enacting prohibitions of new or expanded sites.<sup>31</sup> These sites send out their petroleum coke and coal via barges and ships, leading the U.S. EPA to issue information requests to barge companies serving the sites regarding their compliance with the Clean Water Act's Vessel General Permit. Such actions raise significant questions about the current and future movement of coke and coal on the CAWS, and illustrate why a vital, modern transportation system that functions to the benefit of neighboring communities is needed.

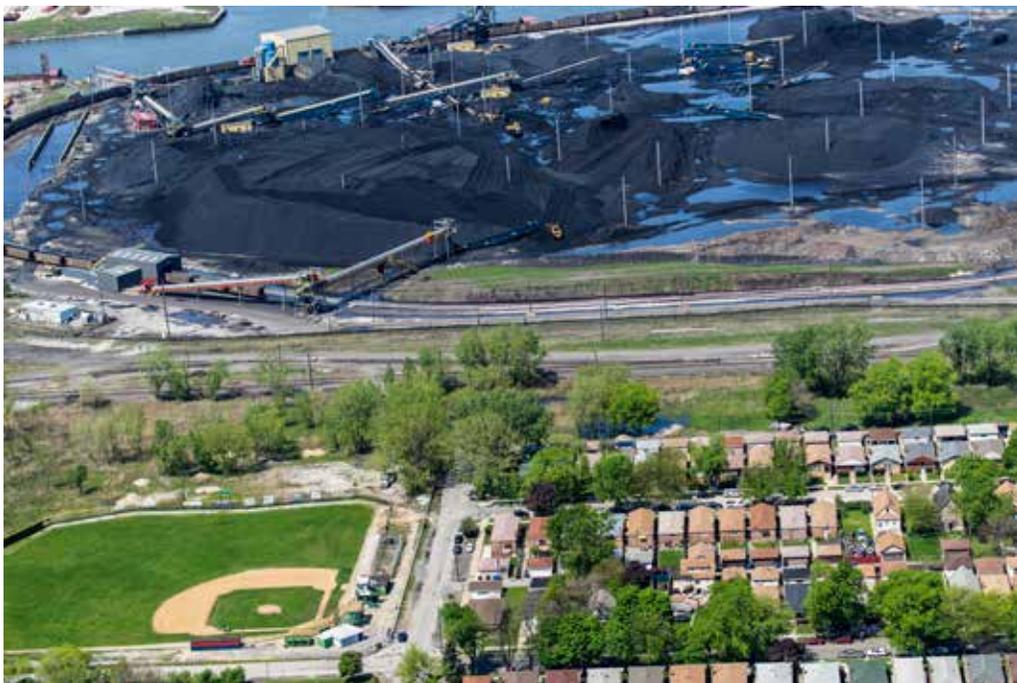
Other infractions we identified along the Calumet Industrial Corridor include:<sup>32</sup>

- Open dumping of waste near entry points to the waterways and holding of thousands of gallons of corrosive hazardous waste in an inadequate tank for more than 20 years,
- Failure of operators to obtain construction and operating permits for existing operations and unreported expansions or modifications that increased harmful air pollution,
- Numerous instances of air pollution in the form of fugitive dust (including lime, iron- and manganese-rich materials) and other particulate matter pollution from plant equipment, and
- Release of hazardous substances potentially exposing people to health threatening pollution.

The nature of these compliance issues and enforcement actions indicates that the offending businesses are either unaware of or are purposefully avoiding their legal responsibilities. Such businesses are likely not using the full range of available modern controls for minimizing their negative impacts on public health and the environment. Many of these facilities are in close proximity to thousands of city residents' homes, parks, places of worship, and other public gathering places. Unsurprisingly, these places are predominantly low-income communities of color. For example, of the nearly 17,000 people who live within a one-mile radius of the largest coke and coal facility facing legal actions, approximately 85 percent are Hispanic and/or African-American and 56 percent live below the poverty line.<sup>33</sup>

Enhanced enforcement of existing laws and regulations is needed, along with updates to bring those laws and regulations in step with modern best practices, to protect these and other city communities.

Further, the city and other local government authorities should revise zoning and other land use ordinances and policies to reflect current community needs, so that these policies do not reflect antiquated assumptions about ports and waterways. Such reform is critical to prevent dirty businesses from operating under the assumption that sub-par controls on pollution are acceptable along the CAWS.



## A BRIGHTER FUTURE

Re-envisioning the CAWS presents a tremendous opportunity to do what is right for the neighbors and nearby residents of the Waterways, the city, and the region. Stakeholders are increasingly focused on ways to maximize the area's environmental and recreational aspects and creating more community-friendly, sustainable economic opportunities.

Recent studies have identified many possible development scenarios for the riverfront, and area stakeholders almost universally want future industrial development to coexist symbiotically with the natural habitat. For example, a coalition of the South Suburban Mayors and Managers Association, nonprofit organizations, public sector agencies, and business leaders is proposing to designate the region south of the Calumet River as a Green TIME Zone—representing a large-scale effort to bring sustainable redevelopment to the southland. This vision includes a livable community supported by green manufacturing jobs and clean, modern rail facilities to move goods in and out.<sup>34</sup> Maritime shipping is not currently part of the plan.

The Calumet River Corridor Economic Development Vision, sponsored by the South Suburban Mayors and Managers Association and published in 2007, calls for a mix of commercial and retail along the river that reinforces “the area's cultural legacy.”<sup>35</sup> It promotes more bicycle and walking paths along the river, connecting to existing trails along Lake Michigan, the Illinois and Michigan Canal, the Burnham Trail, and others. And it proposes creating an entertainment district capable of hosting concerts, summer festivals, and even sporting events on the river itself.<sup>36</sup> In this redevelopment plan and others, the CAWS is envisioned as a recreational and scenic feature and not as a conduit for heavy-industrial shipping.

Similarly, while the City of Chicago's Central Chicago Area Action Plan from 2009 envisions more truck and rail intermodal centers for shipping freight, it omits facilities for moving goods along the CAWS and calls for creating public parks and a riverwalk system to support local shopping and cultural events.<sup>37</sup>

From downtown Chicago—where city officials want a continuous walkway along the river from Lake Michigan to Lake Street—to the Lake Calumet corridor, there are signs of an emerging consensus among residents, politicians, community activists, and business leaders that reinvesting in the river means breaking away from its industrial past.

## CONCLUSION

To move the CAWS to a brighter future—one that brings livable communities, clean industry and protection from aquatic invasive species to Chicago, the region and nation as a whole—we must take a serious look at reconfiguring goods movement on the CAWS and ensuring that the businesses who rely on it are acting as good neighbors. The challenge for CAWS stakeholders is to present a practical vision of the waterway that is in sync with the broader community's legitimate need for a healthy, vibrant future, where the CAWS is a support rather than a threat to a shared, sustainable future.

NRDC has two main recommendations: (1) conduct a detailed, multimodal assessment of and future vision for freight infrastructure and operations that approach the CAWS as an included part of the regional and national goods movement system, while reducing the impact of freight movement on residential communities, and (2) clean up polluting businesses along the waterways and establish a land use plan that draws clean investment consistent with a sustainable future.

To date, assessments of aquatic invasive species control and shipping have taken the current decayed state of the CAWS as a given, failed to account for more recent developments in their projection of waterborne shipping, and stopped short of seriously investigating options for lessening the impact of AIS control on maritime shipping.<sup>38</sup> Moreover, they have omitted larger community concerns and interests in the CAWS. A public planning process is needed to identify businesses that must rely on maritime shipping, as well as ways to strategically integrate the waterways with truck and rail, lessen the impacts of shipping as a whole on surrounding communities, and reduce potential impacts of aquatic invasive species control on maritime shipping. Such an assessment was announced in the Asian Carp Regional Coordinating Committee's 2014 Asian Carp Control Strategy Framework, but to date has not been completed.<sup>39</sup>

If businesses are to operate along the urban waterways—which allows them to reduce their shipping costs and reliance on truck and rail transportation—they must also be good neighbors. Some operators are not meeting this standard and enforcement agencies must continue to investigate and hold them accountable. Moreover, city, state, and federal agencies should update their permitting actions and regulatory standards to reflect modern best practices. The City of Chicago's recent efforts to address coke and coal dust from bulk material handling operations is a good example that can be applied to runoff control, emissions and air quality monitoring, and reporting and recordkeeping, among other areas ripe for improvement.

The good news is that we have the tools to bring the CAWS into the present day. The challenge is to use them.

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