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# Vessel Accumulation and Cargo Value Estimation

# Agenda

- Industry Facts – how trade data can help
- Data Sources and Limitations
- Vessel Cargo Accumulation: Examples of accumulation on containerized and bulk vessels
- Port Cargo Accumulation: Hurricane Sandy Impact and Tianjin Explosion
- Most and Least Valuable Commodities Per TEU

# Insurance Industry Overview

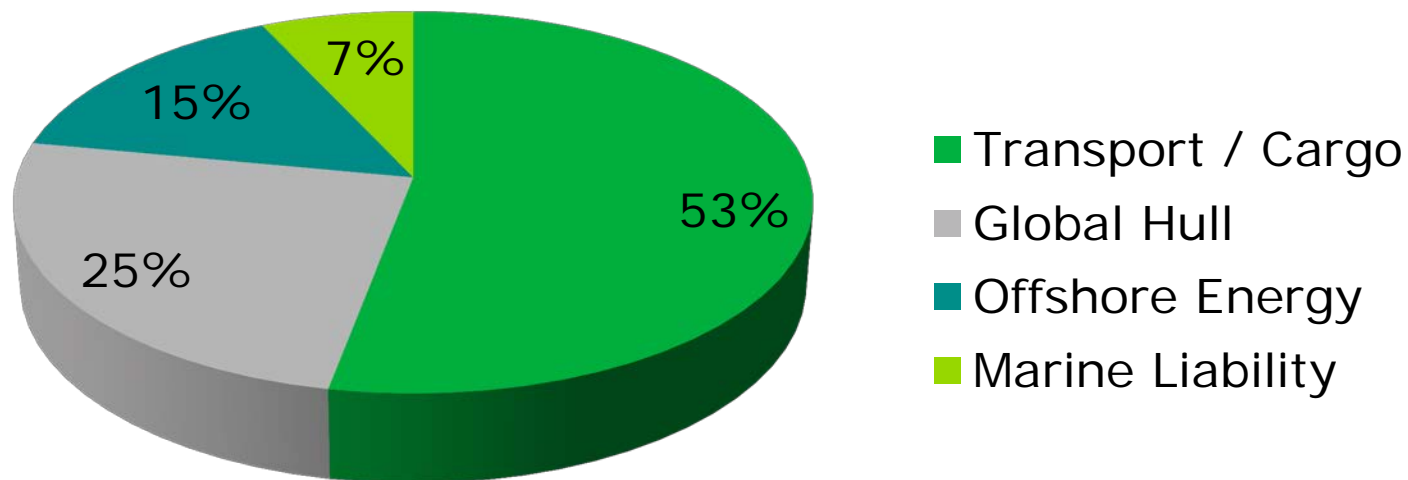
**How much capital is laid out annually on marine insurance?**





## USD 29.9 Billion Premiums issued in 2015\*

### Allocation of Insurance Premiums



\*IUMI 2016, Genoa

## USD 15.7 Billion Cargo Premiums issued in 2015\*

- Tianjin port explosion largest single loss event ever
- Auto industry major contributor to cargo/stock losses



\*IUMI 2016, Genoa

## USD 7.5 Billion Hull Premiums issued in 2015\*

- Gross tonnage has increased 150%+ in last 20 years
- Global marine hull premiums has dropped 25% since 2012
- Inflow of high value vessels continues, outweighs value reduction on renewals



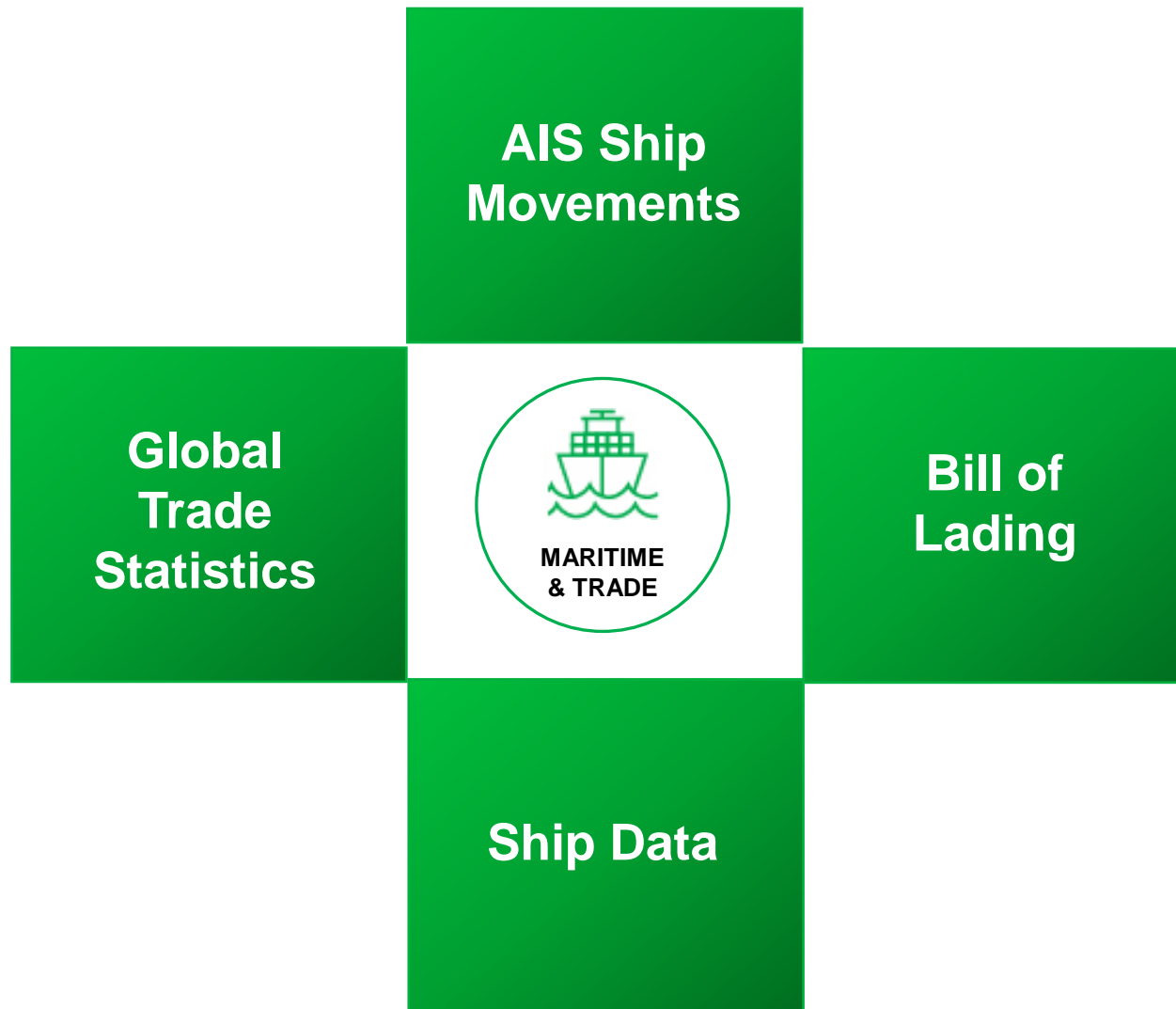
\*IUMI 2016, Genoa



# Data Sources



# Data Sources For Analysis





# Vessel Information

# Benjamin Franklin Cargo Accumulation

The CMA-CGM Benjamin Franklin has capacity to carry over 18,000 TEUs and is the largest vessel to ever call the United States and was carrying in excess of 985 million USD.



# Event Information


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1 of 1 result

### Ship Detail

Ship Name	<b>CMA CGM BENJAMIN FRANKLIN</b>	Shiptype	<b>Container Ship (Fully Cellular)</b>
LR/IMO No.	<b>9706891</b>	Gross	<b>178,228</b>
Call Sign	<b>2IZK8</b>	Deadweight	<b>185,070</b>
MMSI No.	<b>235114033</b>	Year of Build	<b>2015</b>
Flag	<b>United Kingdom</b>	Status	<b>In Service/Commission</b>
Operator	<b>CMA CGM SA The French Line</b>	Shipbuilder	<b>Shanghai Jiangnan Chang...</b>



### Three Year Event Summary

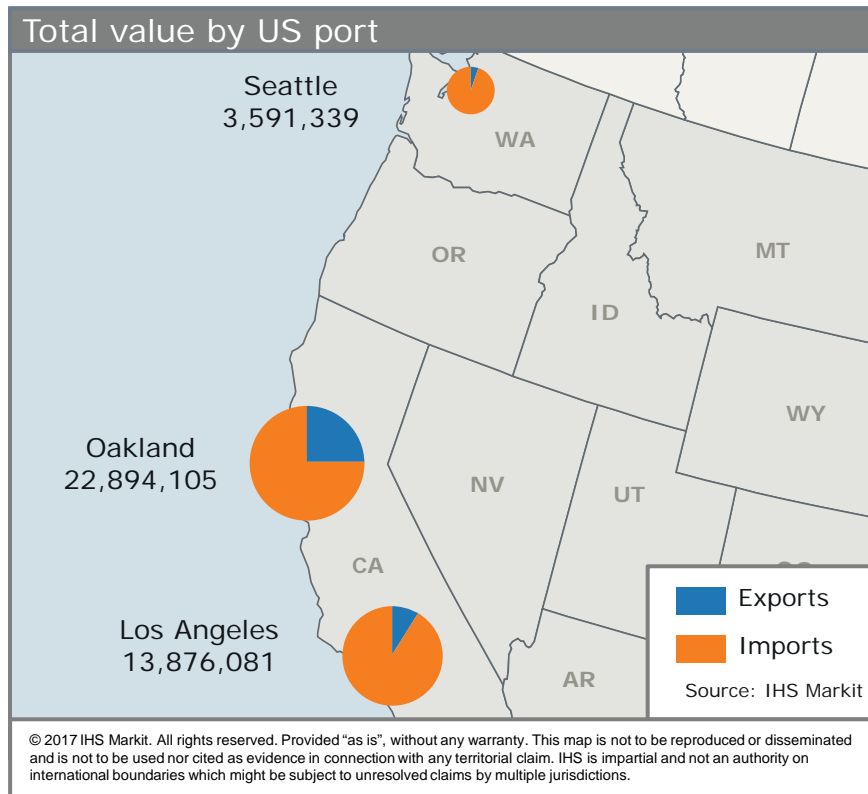
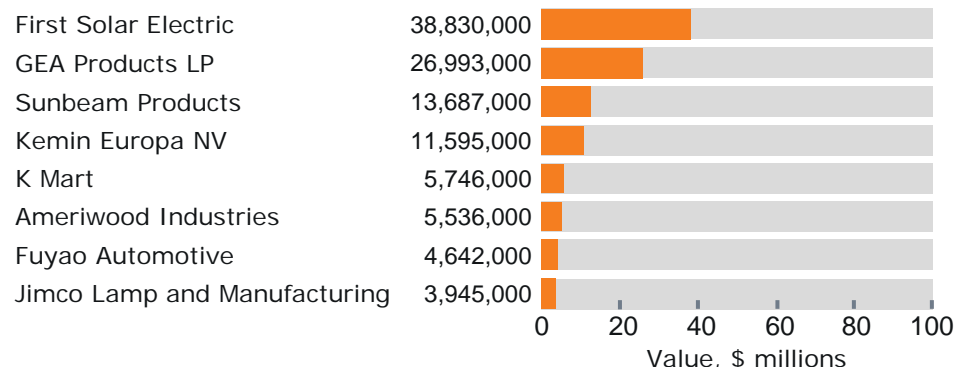
Significant Event	Last 12 months	Between 1 and 2 years ago	2-3 years ago
Casualties	0	0	0
Class status changes	0	2	0
Detentions	0	0	0
DOC certificates	1	1	0
Flag changes	0	1	0
Group Owner changes	0	1	0
Inspections	3	1	0
Name changes	0	1	0

# Cargo and Port Information

Total US-centric value aboard the CMA CGM Benjamin Franklin Q2 sailing



## Total value by US company: Imports





## MSC Flaminia

The MSC Flaminia suffered a fire onboard while carrying over \$115 million USD in cargo. The resulting cargo losses and general average expenses were significant. Detailed bill of lading information shows which exporters were most impacted by the incident.



## MSC Flaminia Voyage String



THE MSC Flaminia made a regular voyage that called Houston, New Orleans, and Charleston before heading across the Atlantic. This is the exact string she made before the casualty.

The MSC Flaminia voyage **1225** was involved in the incident. On board at the time were **2,976** containers carrying an average of about **\$38k** worth of cargo per container.

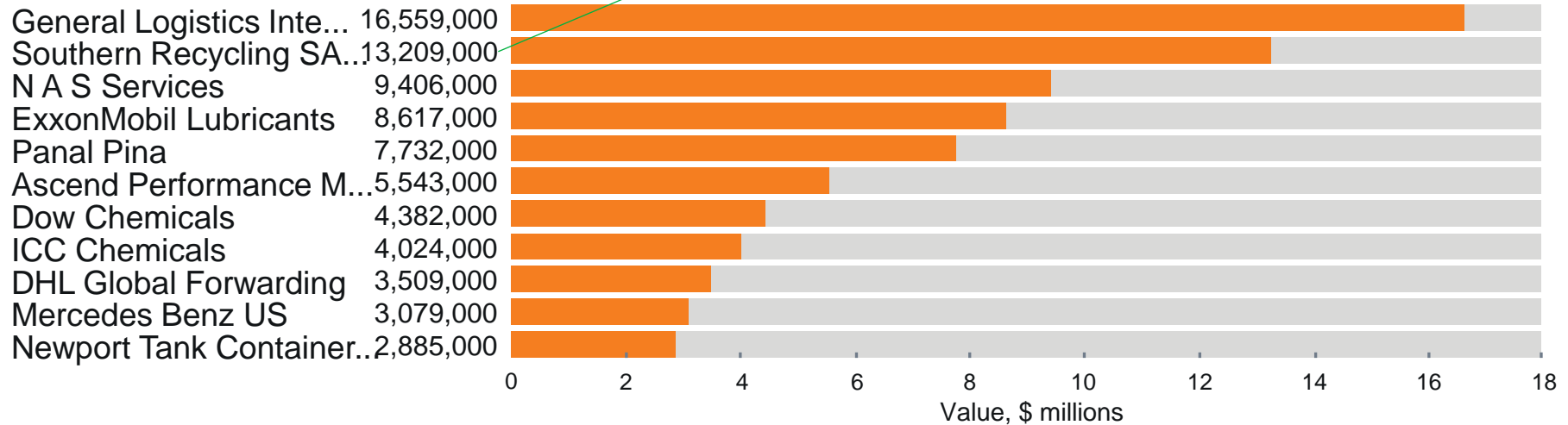
Voyage Number	Cargo On Board
Voyage 1215	\$84.9m
Voyage 1218	\$616.4m
Voyage 1222	\$240.3m
Voyage 1225	\$115.4m

# MSC Flaminia: Shippers Impacted and Value (USD)

General Logistics –  
USD 16.5m

Southern Recycling –  
USD 13.2m

## Total value by US exporter





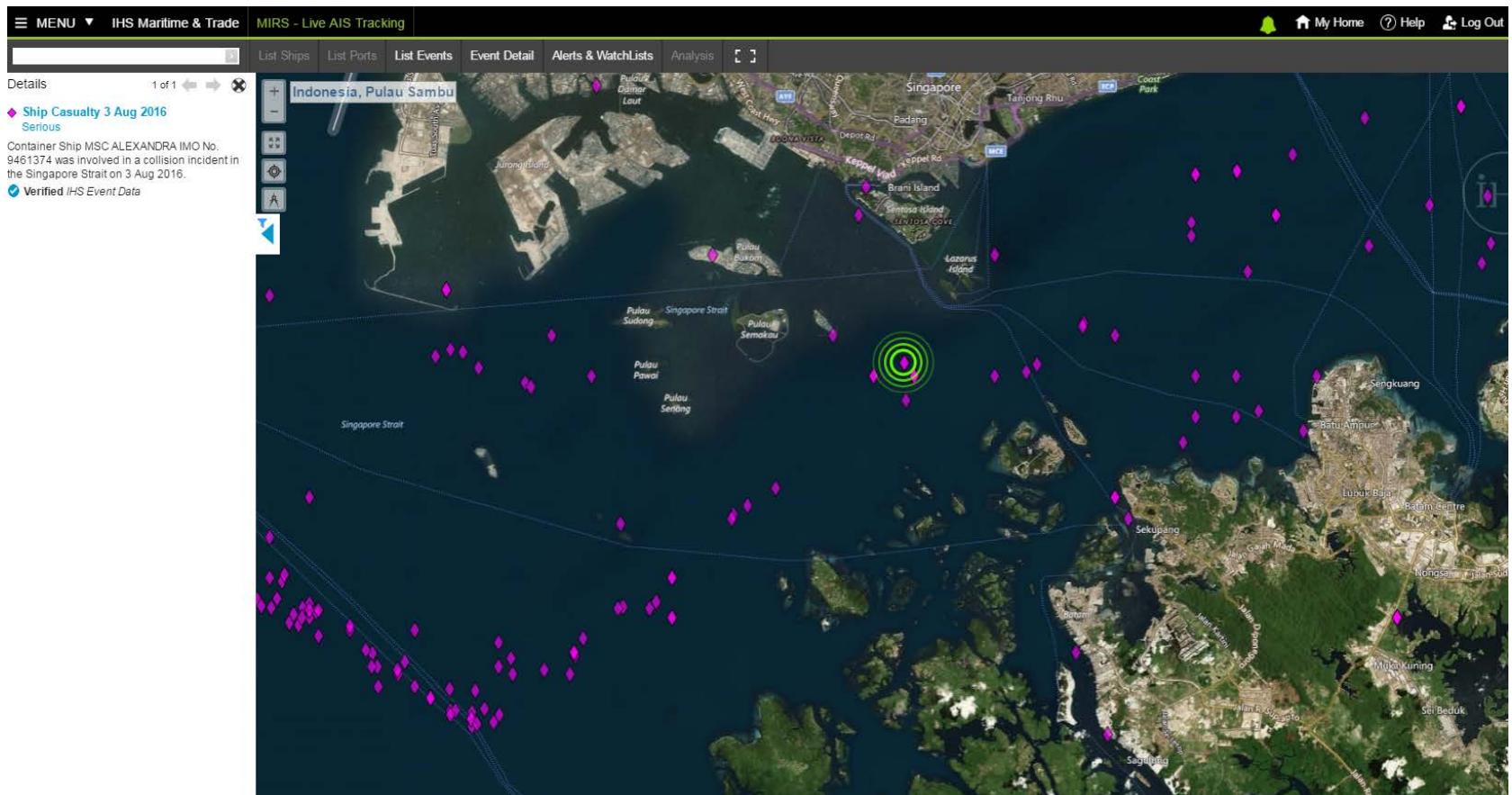
## MSC Alexandra incident

The MSC Alexandra was damaged in April 2016 in a collision with the very large crude carrier, Dream II, in the Singapore Strait.



# Casualty Position on Map

The spatial layering of verified events can lend more insight when seen on a map. This slide shows the location of the collision between The MSC Alexandra and Dream II on 3, August 2016.



# Vessels Involved

## Dream II



- The Dream II was carrying an estimated \$190,000,000 worth of crude oil at the time of collision.
- Cargo was not damaged in this particular incident, but the vessel did go for repairs for hull damage.

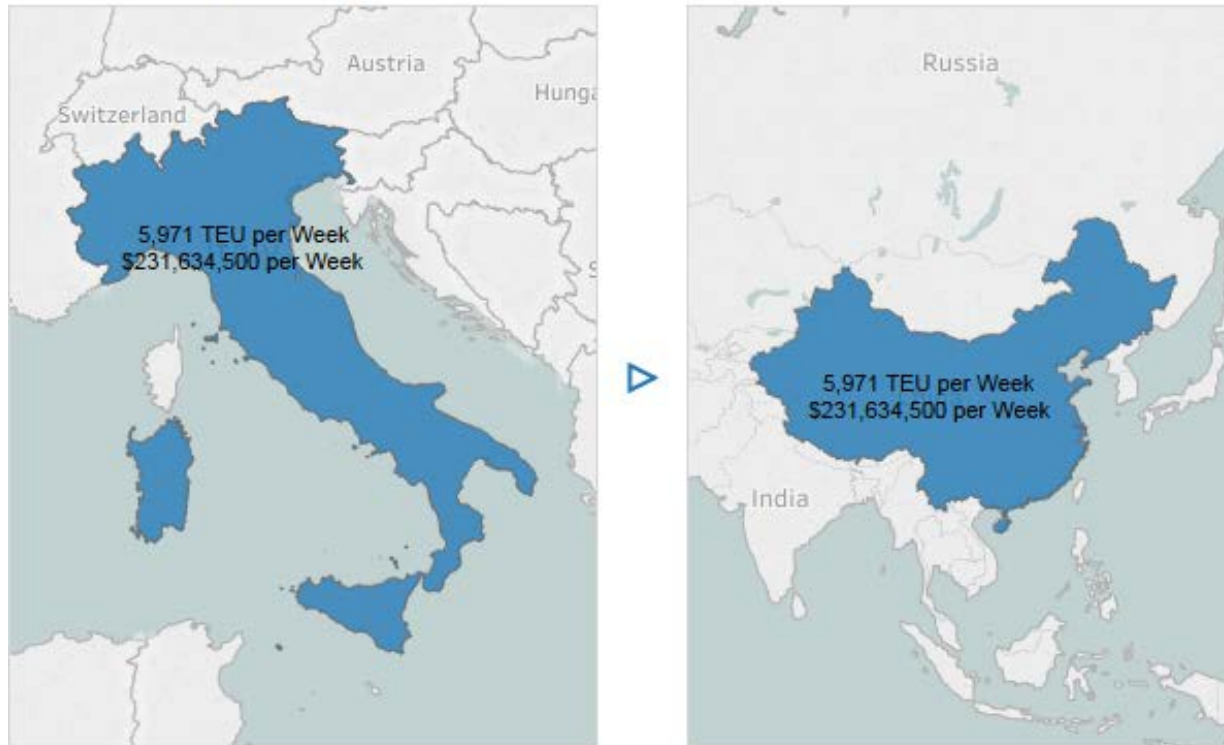
## MSC Alexandra



- The MSC Alexandra was a transporting cargo between Italy and China.
- Suffered both cargo loss and hull damage.

# Italy – China Waterborne Trade Market

## 2016 YTD May Average Weekly Containerized Tradeflows from Italy to China

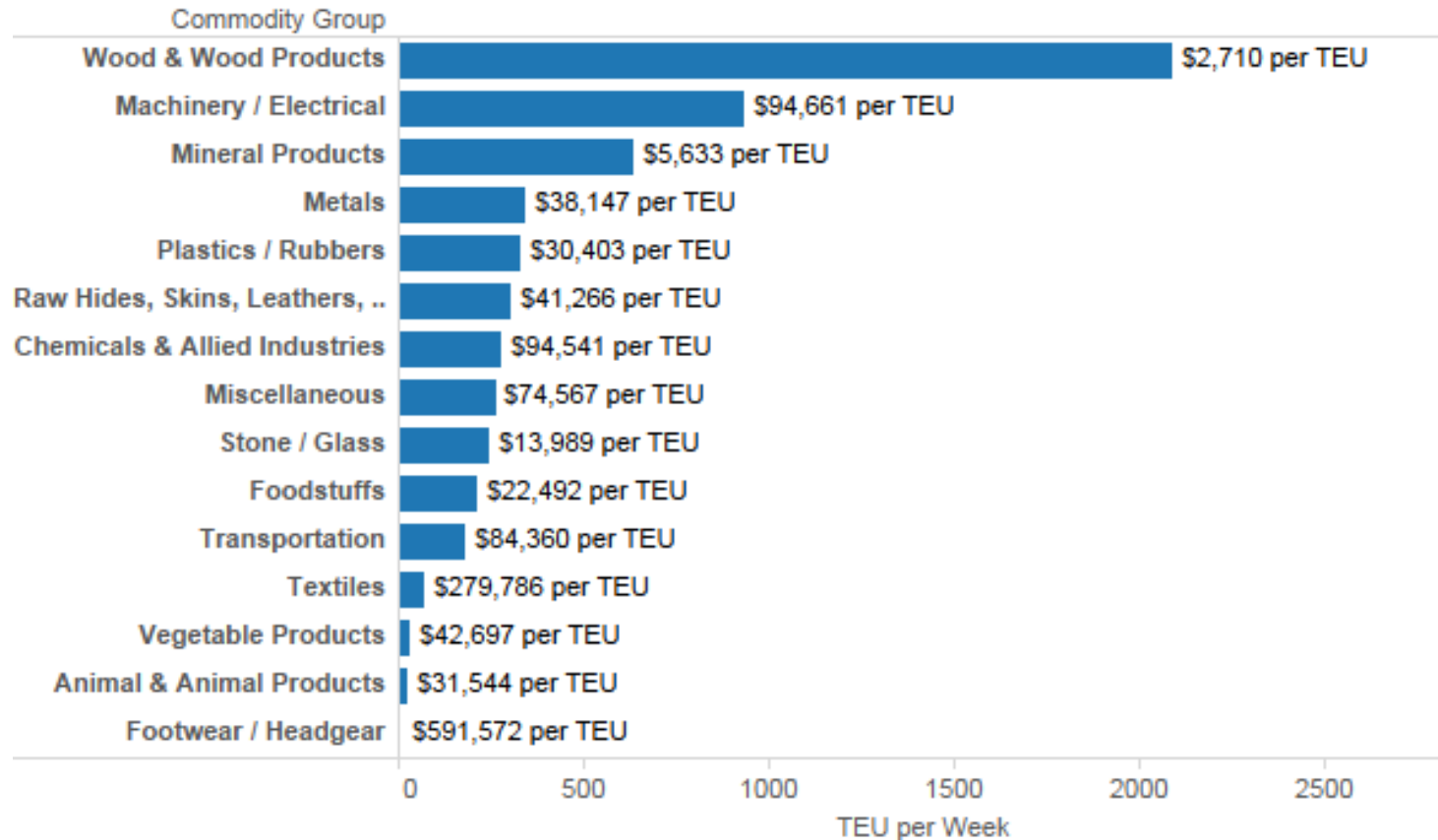


The Italy to China market is sizeable and highly valuable. Understanding the scope and size of a market helps to assess potential risk along trade routes.

- 5,971 TEUs of cargo are traded per week
- \$231 million of cargo value traded per week

# Typical Volumes Moved

## Average TEU per Week vs Value per TEU



The top 15 commodities listed above range in value from relatively cheap TEUs worth of Wood and Wood Products in large volumes through very expensive textiles on this trade. Understanding this market composition allows underwriters to have a better idea of potential risk.

# Estimating Bulk Tanker Accumulation





## Eagle Boston Accumulation







# Eagle Boston Accumulation



## Eagle Boston December Voyage

Sail Date 8 December

Arrival Date 22 December

Volume on board 721,949 barrels

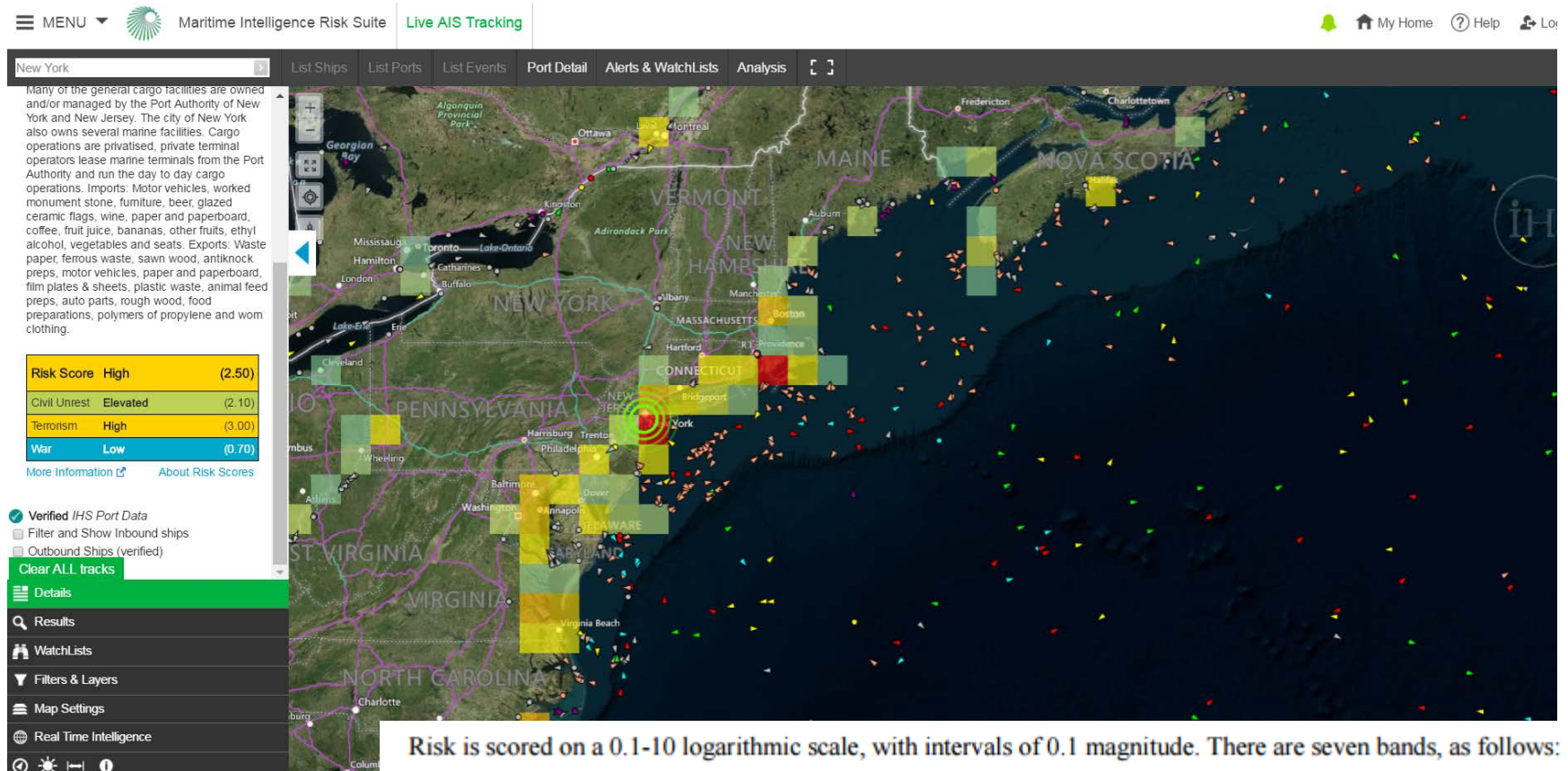
Approximate value on board ~\$35,000,000

# Estimating Cargo Accumulation for Bulk Tankers

- There are cases where bills of lading are not necessary at all to estimate cargo on board a vessel
  - > Bulk Tankers are the best example of this, and the analysis can be done between any two ports on earth.
  - > Using information on vessel positioning, port callings, and depth in the water an estimate of the total volume of cargo on board can be created.
  - > To apply a value estimation, one may use global trade statistics. Based on historical trade flows and volumes we can estimate value figures based on the volume on board.
  - > By measuring loading and discharging of cargo, one can monitor accumulation over the course of a string.

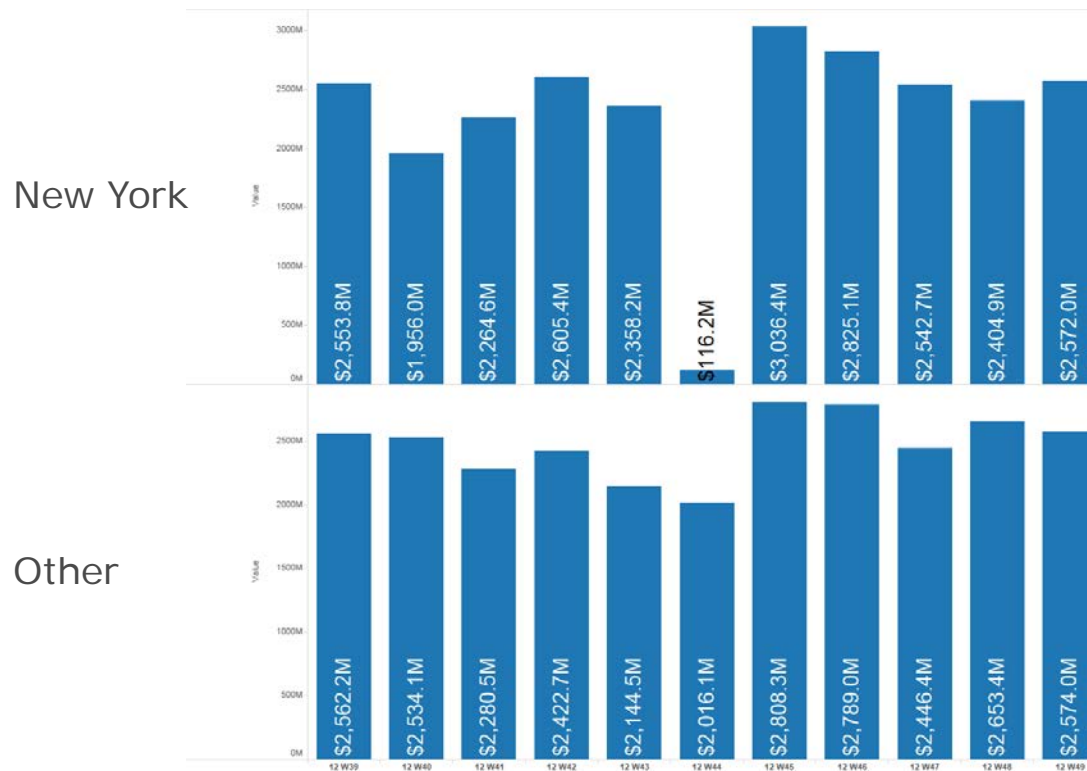
# Port Accumulation Information

# Port of NY/NJ



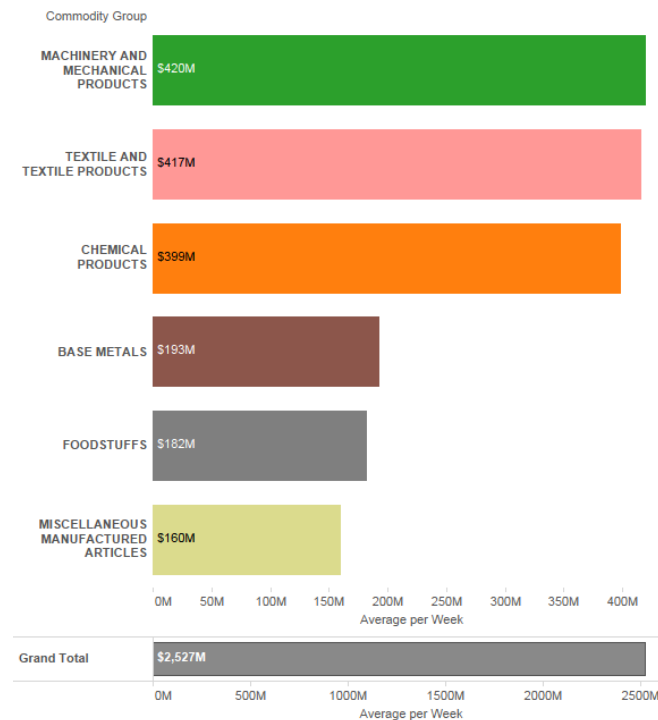
# Hurricane Sandy

Hurricane Sandy had a huge impact on the Port of NYNJ vs. the rest of the US east coast in terms of import volume. The week before Hurricane Sandy, NYNJ accumulated \$2.3 billion worth of value. We can see that in the weeks following Sandy, the entire east coast ports increased their accumulation.

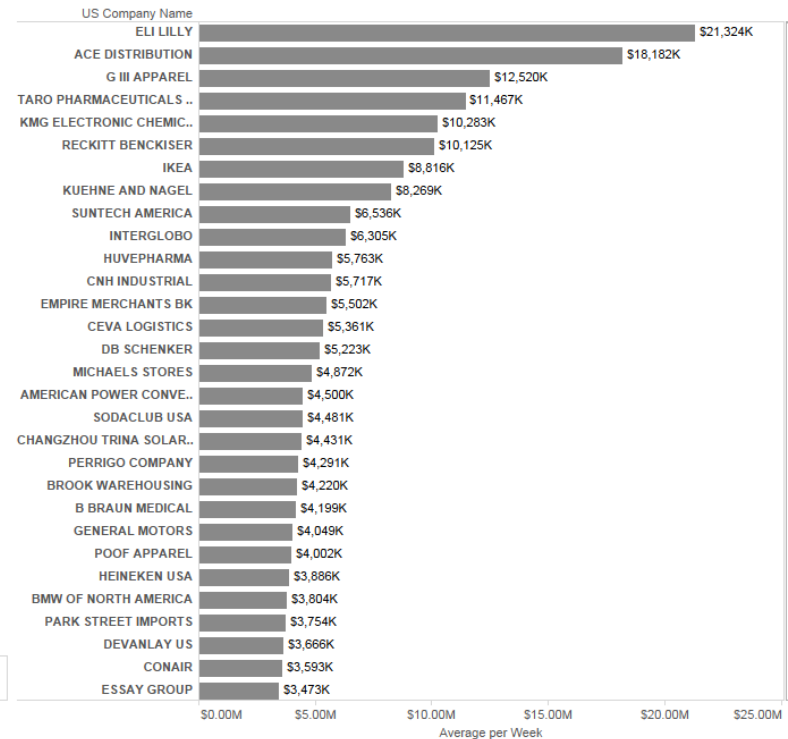


# Port of NY/NJ Typical Cargo Accumulation

Weekly Average Value of the Top 5 Imported Commodities Pre Hurricane Sandy



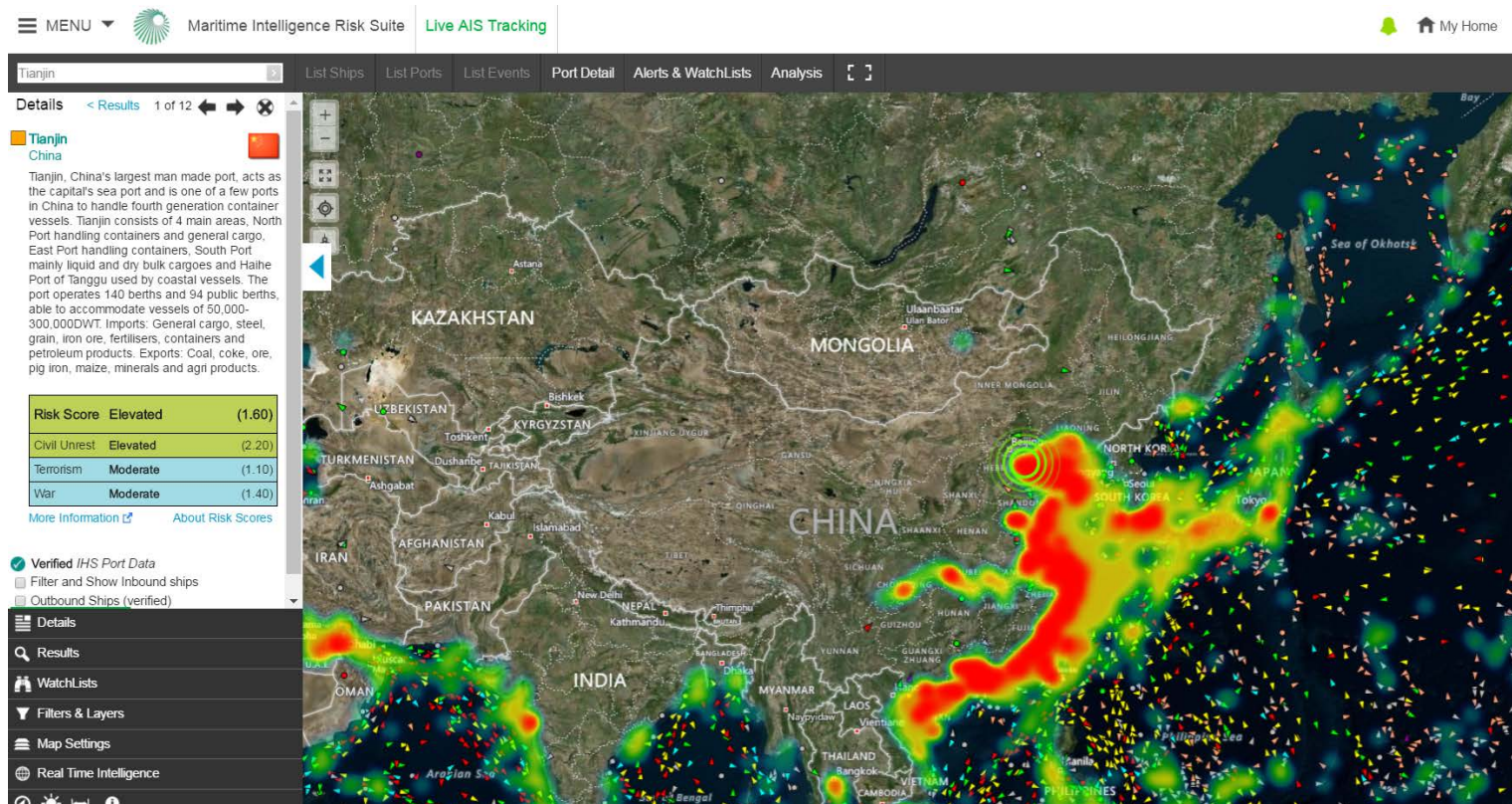
Average Weekly Import value by US Consignee Pre Sandy



Typical values for commodities imported into the Port of NY/NJ are over \$2.5 billion per week. The major commodities and companies that have the most cargo value going through the port are listed above.



# Chinese Ports





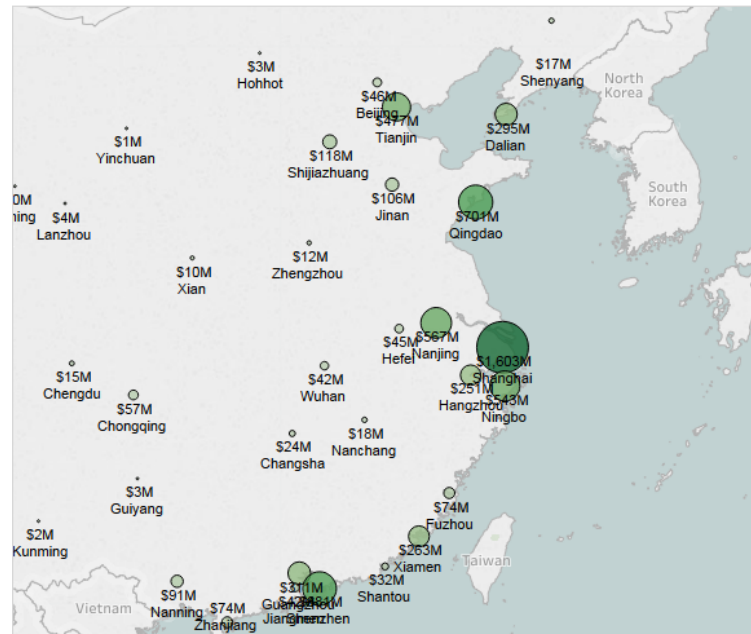
# Throughput in China's Districts

The numbers on the maps above indicate daily throughput in terms of value for districts in China. Using data like these we can understand the potential accumulation of cargo in the case of a disaster.

## Noteworthy Ports:

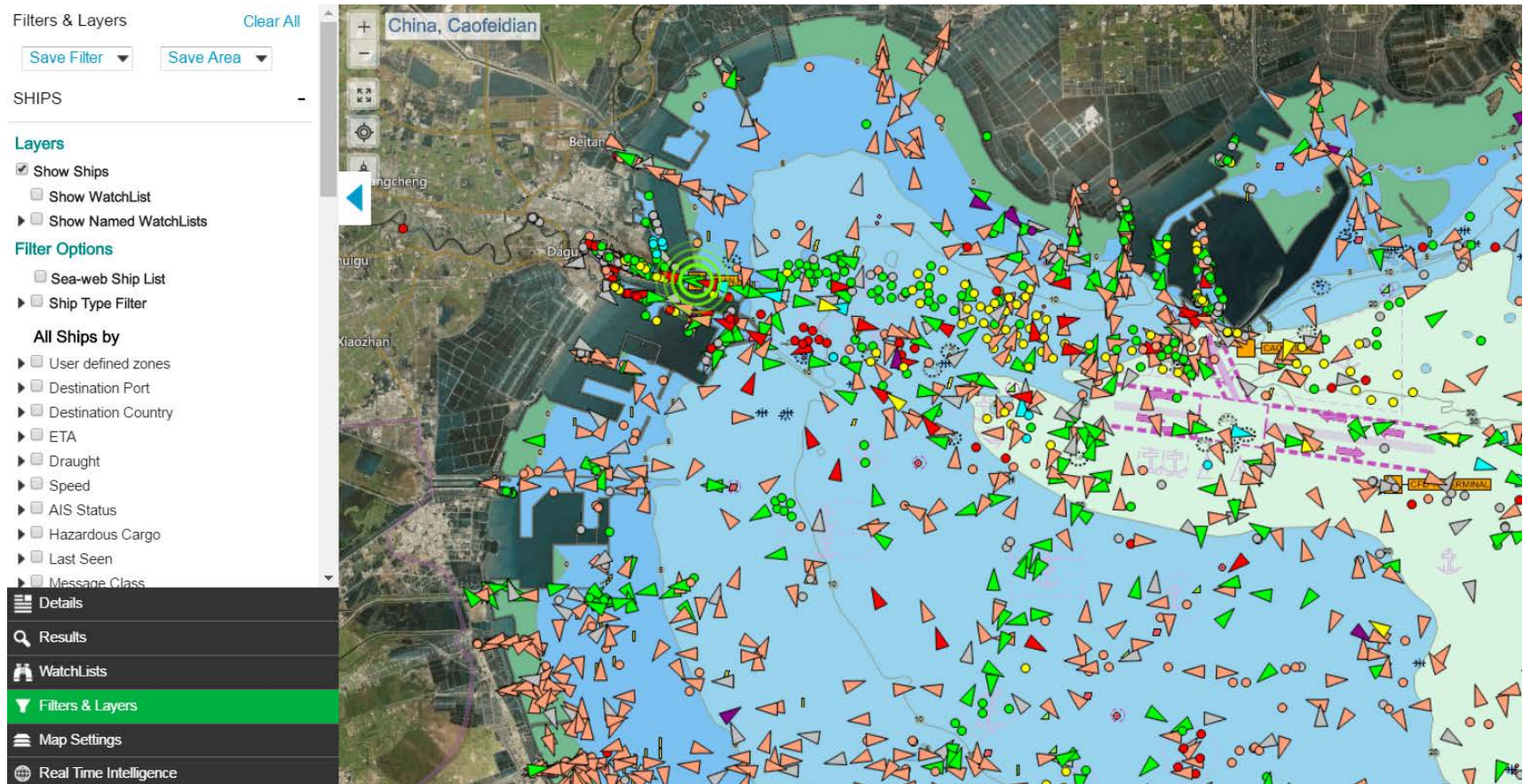
- **Tianjin:**  
\$477M/day
- **Guangzhou:**  
\$311m/day
- **Shanghai:**  
\$1.6B/day
- **Shenzhen:**  
\$681m/day

Tianjin Average Daily Value - July 2015



Average Daily Trade Value per China Districts

# Tianjin Incident



## Ships types in port Tianjin at time of incident

Ship Types	No of Ships	Total Cargo Capacity in \$
Bulk Carrier	205	\$19,911,825,729
Container Ship	157	\$17,718,503,473
General Cargo	103	\$3,040,725,897
Tanker	98	\$6,941,662,283
Tug/Supply Ship (O.R.S.V.)	50	
Vehicles Carrier	30	\$4,073,348,174
Supply Ship (O.R.S.V.)	23	
Tug	21	
Liquefied Gas Tanker	17	\$21,795,691
Ore Carrier	7	\$1,640,114,970
Other	43	
<b>Total</b>	<b>754</b>	<b>\$53,347,976,217</b>

## Tianjin top 10 daily commodity throughput

Average Daily Value of Tianjin Imports & Exports	USD
Vehicles	74M
Nuclear Reactors, Boilers, Machinery & Mechanical Appliances	59M
Iron & Steel	46M
Mineral Fuels & Oils	34M
Electrical Machinery & Equipment/Parts	30M
Iron & Steel Articles	25M
Plastics & Articles	16M
Ores, Slag & Ash	15M
Oil Seeds, Fruits, Misc Grains	15M
Optical, Photographic, cinematographic, Medical Instruments	14M

Looking specifically at Tianjin, we can see their top 10 commodities make up almost \$200m of daily throughput. In the case of another disaster these are the industries that could be hit hardest.

# Commodity Values

## Commodity Values Per TEU

Commodity	USD Per TEU
Machinery and Mechanical Appliances	\$10,058
Cellular Phones	\$440,136
Hydraulic Turbines	\$113,742
Soy Beans	\$8,130
Bananas	\$5,295
Chemical Wood Pulp	\$8,870
Generators	\$190,754
Maize	\$3,784
Furniture and parts thereof	\$14,702

## Top 10 Commodities Value per TEU

Commodity	USD Per TEU
Diamonds	\$1,188,631,862
Platinum	\$144,261,377
Jewelry	\$64,357,405
Gold	\$39,803,169
Pearls	\$17,605,939
Wrist-watches	\$9,152,707
Silver	\$5,104,682
Paintings	\$3,233,022
Human Blood	\$3,085,526

- Note: these values of commodities per TEU are IF they moved via ocean, most do not.



## Bottom 10 Commodities Value Per TEU

Commodity	USD Per TEU
Water	\$80
Slag Sand	\$220
Pebbles and gravel	\$240
Sands of all kind	\$313
Sheets for Veneering	\$539
Salt	\$630
Ash	\$645
Ceramic building bricks	\$657
Chalk	\$782

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