

NOAA Hydrographic Services Review Panel
**“Economic impacts of restricted visibility and fog,
a case study for Galveston and Houston ports and enclosed waterways**

By Prof. Maria G. Burns * College of Technology * University of Houston



Modern Fog Technologies

Examples: Ports of Rotterdam and Hamburg



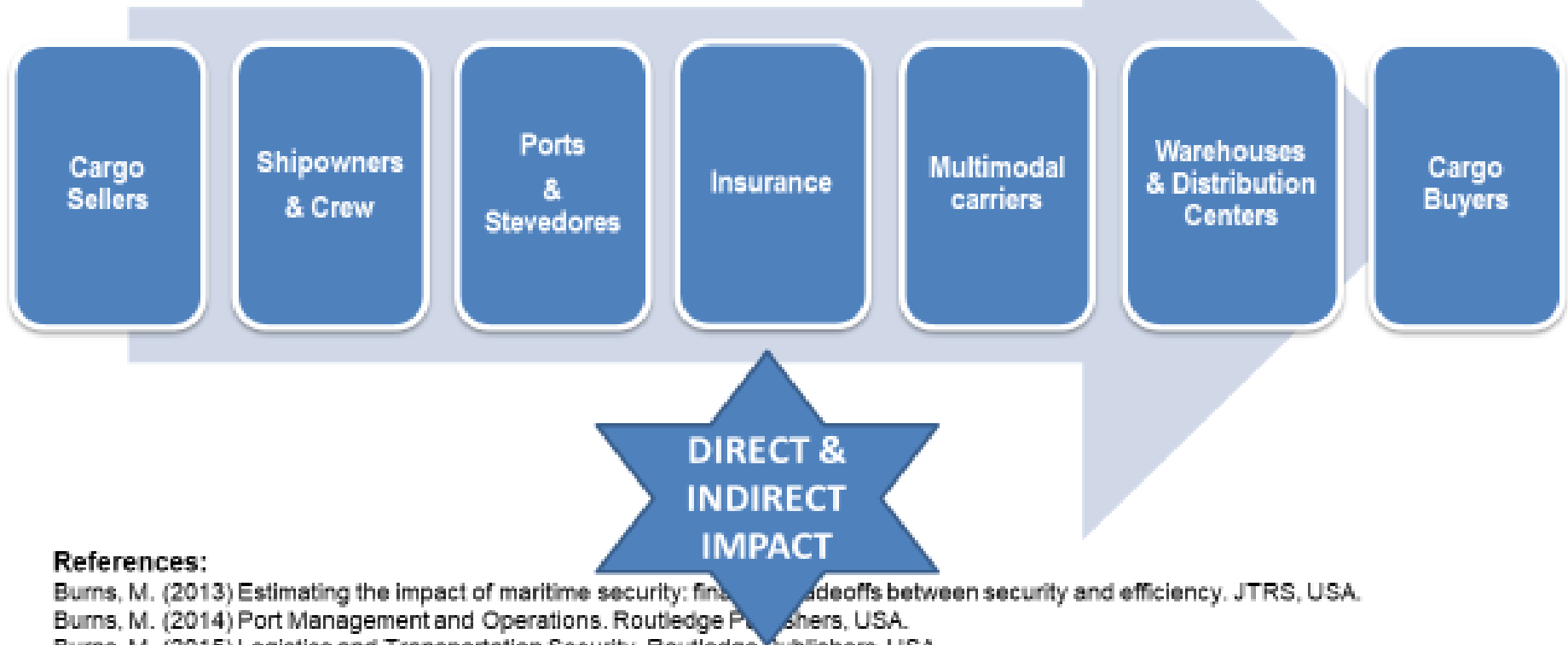
Modern Fog Technologies

A case on the Houston-Galveston Region



Key players impacted by Fog

The losses spread across the supply chain

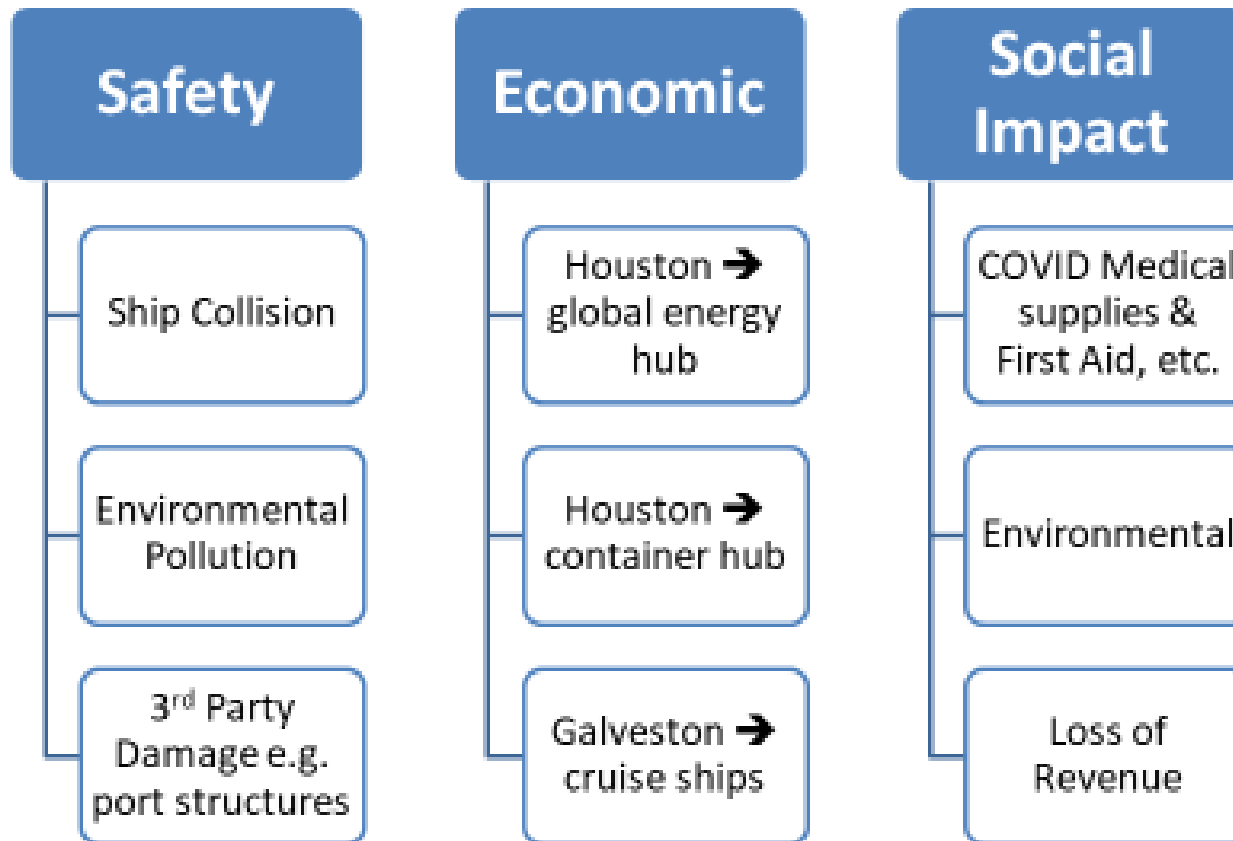


References:

- Burns, M. (2013) Estimating the impact of maritime security: finding tradeoffs between security and efficiency. JTRS, USA.
- Burns, M. (2014) Port Management and Operations. Routledge Publishers, USA.
- Burns, M. (2015) Logistics and Transportation Security. Routledge Publishers, USA.
- Burns, M. (2020) Maritime Security and Operations. Routledge Publishers, USA.

**DIRECT &
INDIRECT
IMPACT**

Impacted Areas of Fog Disruptions



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Impacted Areas of Fog Disruptions

Examples of direct & indirect impact

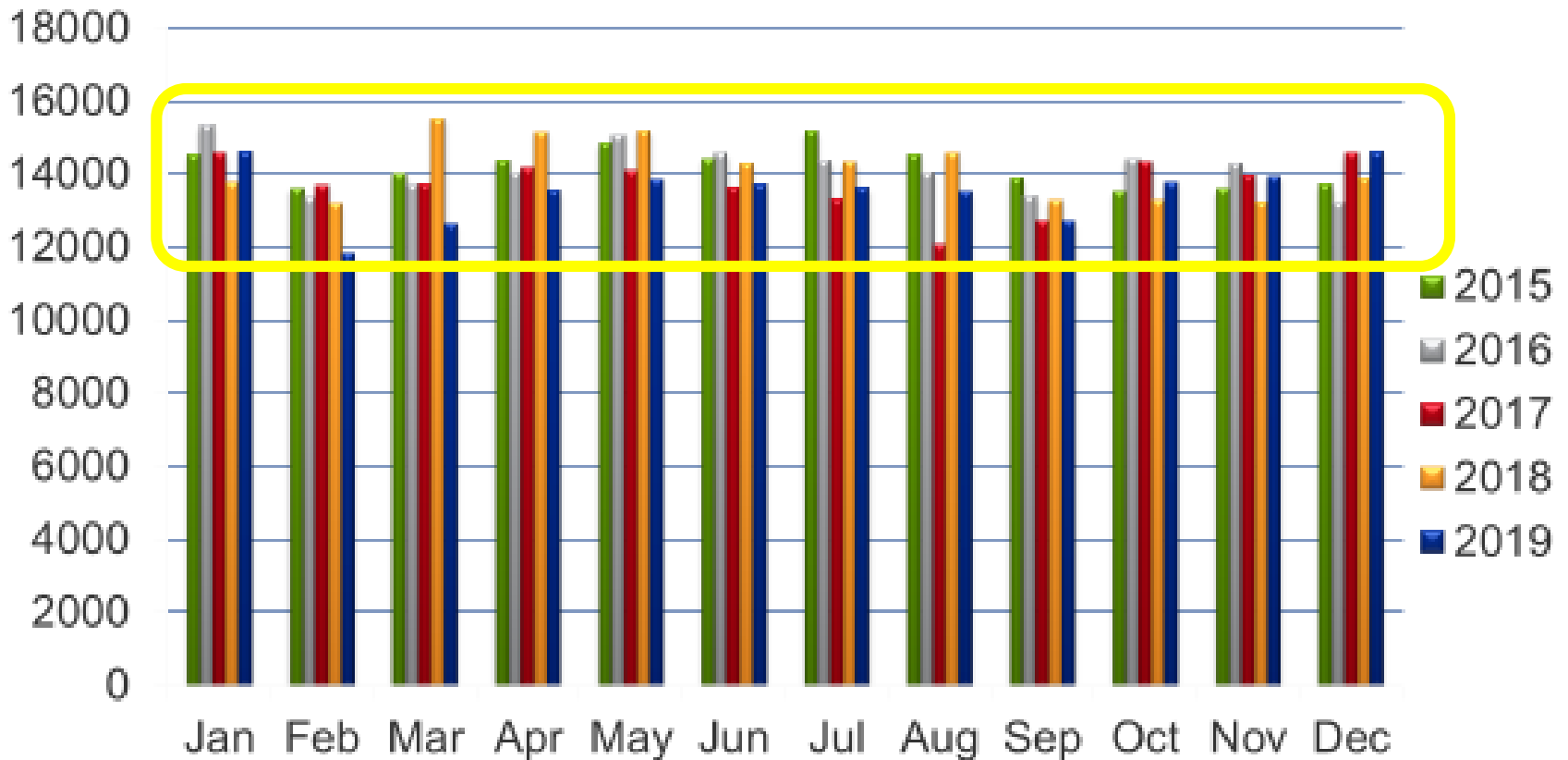


M. Burns- NOAA

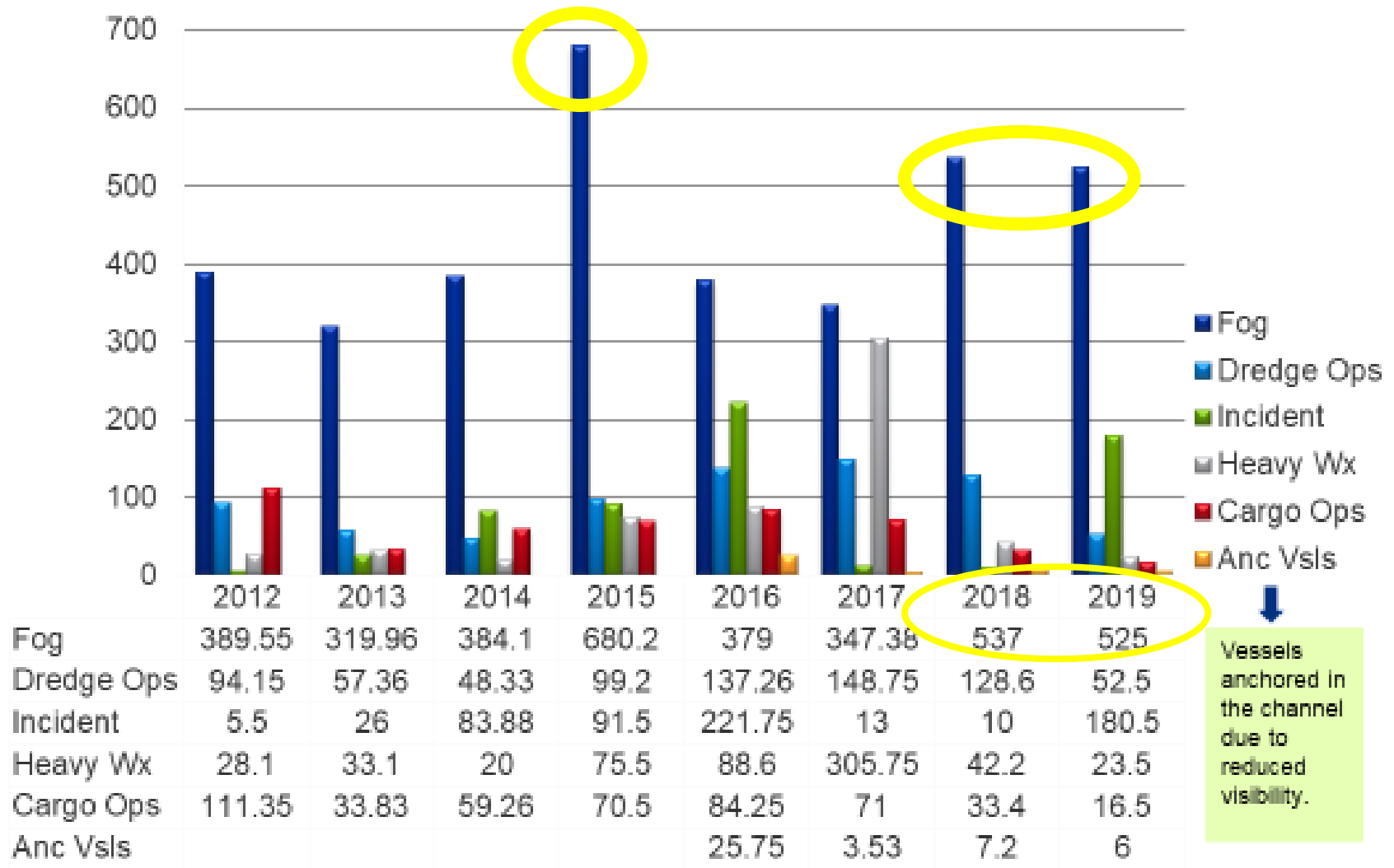
Typical Day in the VTSA - 2019

Average		High
42	Tanker Transits	63
20	Freighter Transits	32
2	Cruise Ship Transits	5
71	Ships in Port	112
366	Tow Transits	482
162	Ferry Transits	210
14	OSV /Miscellaneous	37

Monthly Comparison: 2015 - 2019



Channel Closure Hours



Impacted Areas of Fog Disruptions

Daily Traffic	Average	High
Ocean-going ships	135	212
Smaller ships (Coastal & Inland)	542	729

Annual Fog facts	Hours	= Days
2019	525	21.875
2018	537	22.25

Source:

Estimations based on USCG (2020) State of the Waterway 2019. Operations/Training Manager, VTS Houston-Galveston. Presented by Brian Smith, USCG VTS. Lone Star Harbor Safety Committee. 02/26/2020

Supply Chain Impact

Port congestion (delayed ship entries and departures)

Tows, barges, pilot ships delayed

Delays in ship inspections (e.g. USCG, Vetting, etc).

Shippers' demurrage charges

Insurance costs

Passengers delayed *e.g. Galveston, 20,000 travelers delayed/stranded for 5 consecutive days.*

Multimodal delays, e.g. trucks

Warehousing delays

References:

Estimation by Maria Burns, based on primary data provided by USCG VTS (2020) State of the Waterway 2019. Operations/Training Manager, VTS Houston-Galveston. USCG VTS. Lone Star Harbor Safety Committee. 02/26/2020

Detailed Estimations, algorithms, cases:

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- <https://www.khou.com/article/money/closure-of-houston-ship-channel-because-of-itc-fire-could-cost-1b/285-f3e7f897-6f33-4179-bffe-4cc72c0f34b1>

Annual losses at the Houston Ship Channel for 2019

~ 22 Days of fog annually

Economic losses due to fog

Impacted variable	Median values (estim.)	High values (estim.)
Loss per ship • <i>Regional, Commercial, Workforce losses</i>	~ \$1 million	~ \$4 million
1 Day's port traffic <i>(number of ships)</i>	135	212
1 Day's impact of fog <i>In the Houston Ship Channel</i>	\$135 million \$1 mil x 135 ships \$212 million \$1 mil x 212 ships	\$540 million \$4 mil x 135 ships \$848 million \$4 mil x 212 ships
Annual impact of fog <i>Example:</i> 22 days in 2019	\$2.97 billion \$135 mil x 22 days \$4.664 billion \$212 mil x 22 days	\$11.88 billion \$540 mil x 22 days \$18.656 billion \$848 mil x 22 days

IMPORTANT NOTES

1. The above estimation assumes that all the ships at the Houston/Galveston area are affected/halted by fog.
2. The above estimation does NOT include barges and smaller vessels, due to the diverse use of these ships (support vessels, not always carrying cargoes).

References:

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Observation:

Why don't we know about these losses?

1. Because the losses are suffered by hundreds of companies;
2. Because the private sector does not like to talk about their losses;
3. Because fog, and weather conditions are stipulated as "Act of God";
Many insurance policies cover segments of the losses.

Carriers, Cargo owners, insurance companies share the losses, and move on...

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Thank You.