



CANAL DE PANAMÁ

PANAMA CANAL TRAFFIC: A STRATEGIC FORESIGHT INTO MARITIME TRENDS

November 2019

Original Canal Infrastructure



Gatun Lake

Gatun Spillway

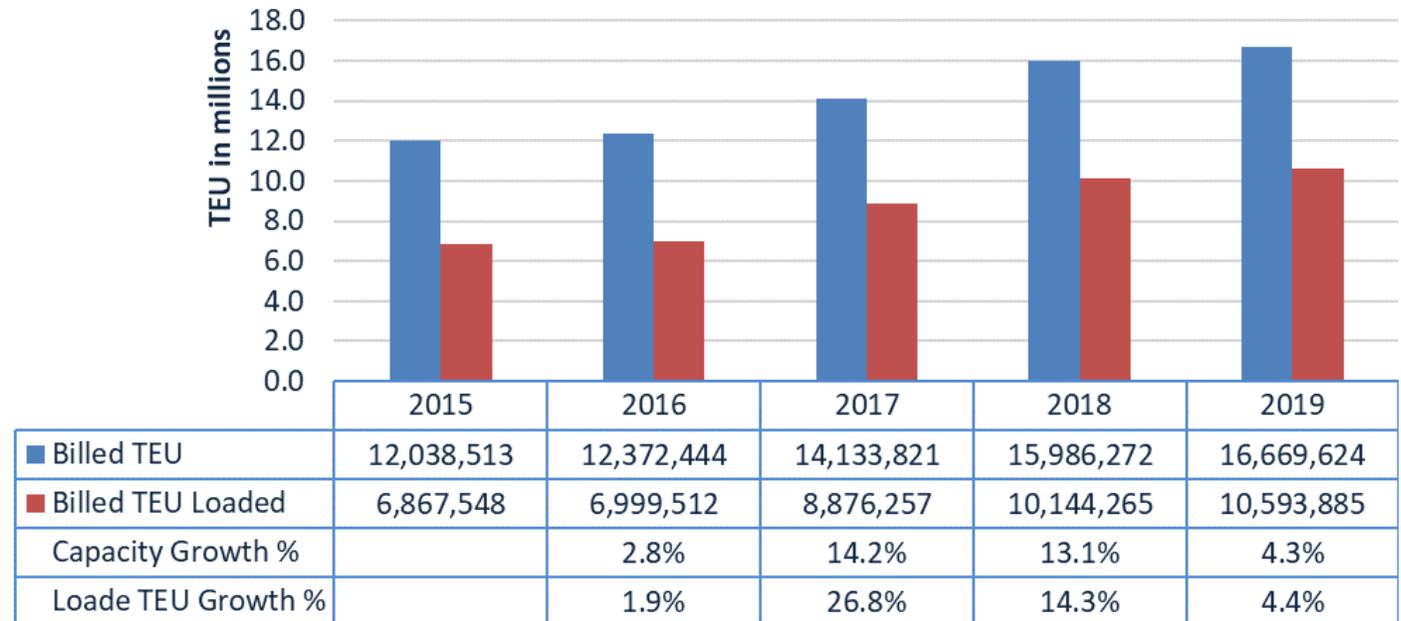
Water Saving Basins

Gatun Locks

30 Liner Services Connecting the World through The Panama Canal

- 16 Neopanamax liner services
 - Annual capacity : 7.8 M TEU (one way)
 - Average vessel size: 9,340 TEU
 - Asia – East Coast of the United States: 75% of the total Neopanamax capacity
- 14 Panamax liner services
 - Annual capacity : 2.2 M TEU (one way)
 - WCSA to USEC and Europe routes: 50% of the total Panamax capacity
- Transshipment activities in Panamanian terminals:
 - Annual capacity: 5.7M TEU per year
 - 37 feeder services
 - 27 calling at the Atlantic Container Terminals
 - 10 calling at the Pacific Container Terminals

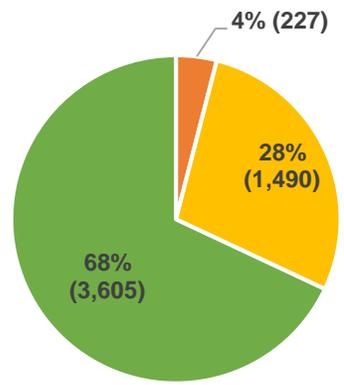
TEU Growth in Containerships transiting the Panama Canal
2015 - 2019



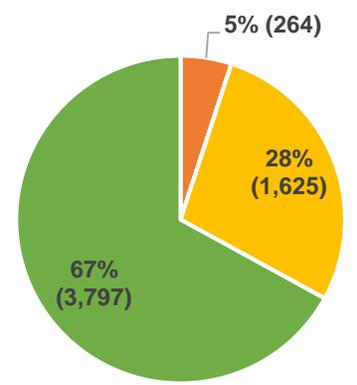
96% of the World Container Fleet can Transit The Panama Canal

- By 2022, 95% of the vessels will be able to transit the Panama Canal.
- 5% of the vessels will be Post Panamax up to 23,000 TEU.
- Post Panamax are mainly deployed in the Asia – Europe and Intra-Asia shipping routes.
- Currently, United States ports can handle up to 18,700 TEU.

Container World Fleet by 2019

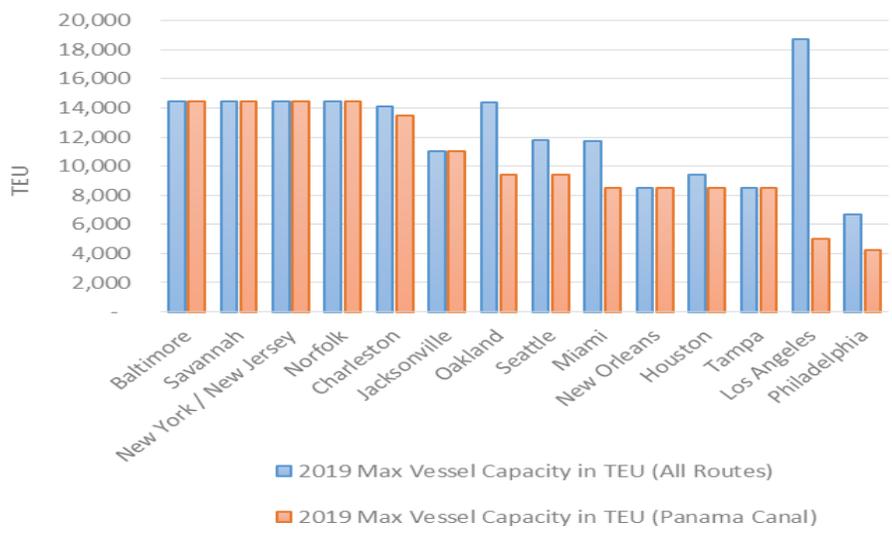


Container World Fleet by 2022



Legend: Post Panamax (orange), Neopanamax (yellow), Panamax or less (green)

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Port	2019 Max Vessel Capacity in TEU (All Routes)
Baltimore	14,424
Savannah	14,424
New York / New Jersey	14,424
Norfolk	14,424
Charleston	14,100
Jacksonville	11,010
Oakland	14,414
Seattle	11,800
Miami	11,708
New Orleans	8,533
Houston	9,411
Tampa	8,533
Los Angeles	18,720
Philadelphia	6,655

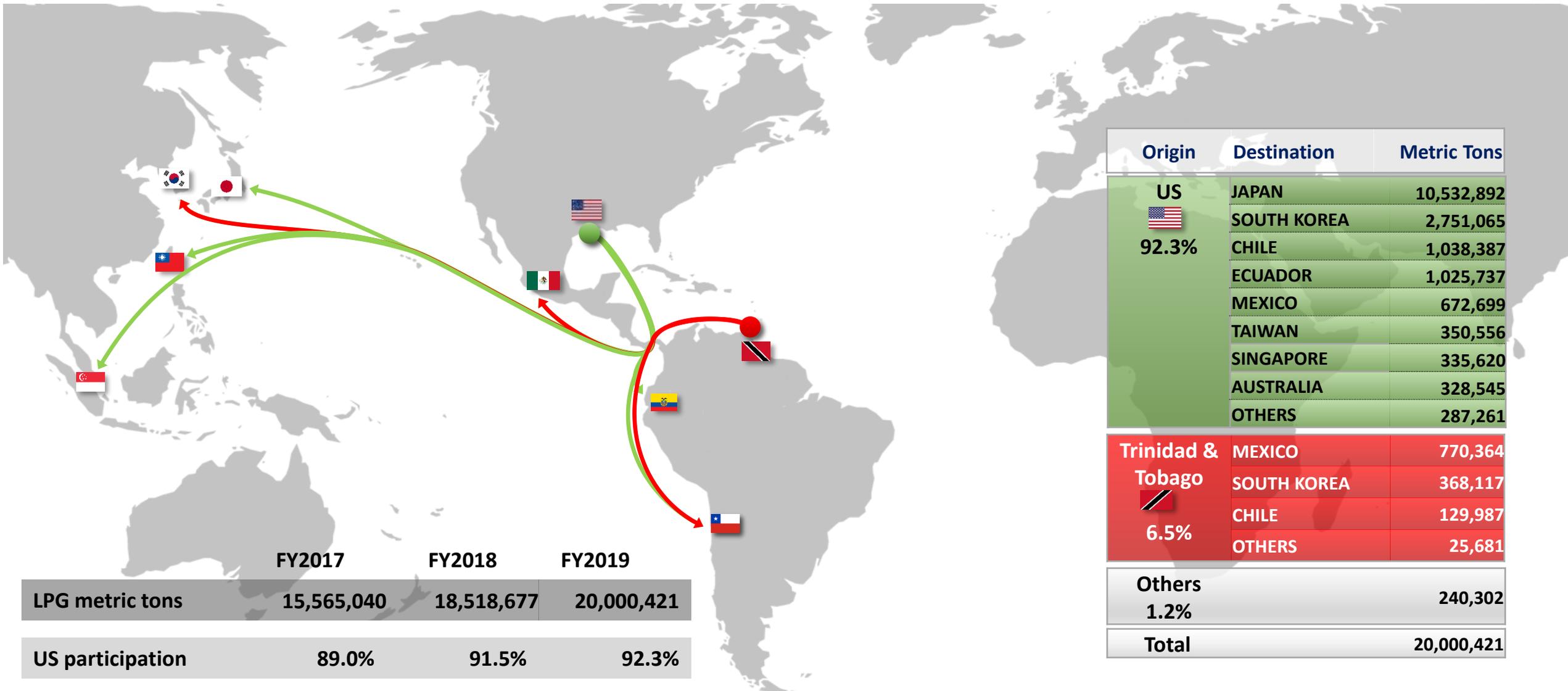
Source: ACP NTA-SL, Fairplay World fleet and Compair Data, October 2019.



Vessel Size: Container Vessel Triton

Vessel type: Containership
Customer: Evergreen
Total cargo capacity: 15,313 TEUs
LOA: 369 m
Beam: 51.2 m
Draft: 12.6 m
Flag: Malta
Transit charges: \$1,213,000
Transit date: May 15, 2019

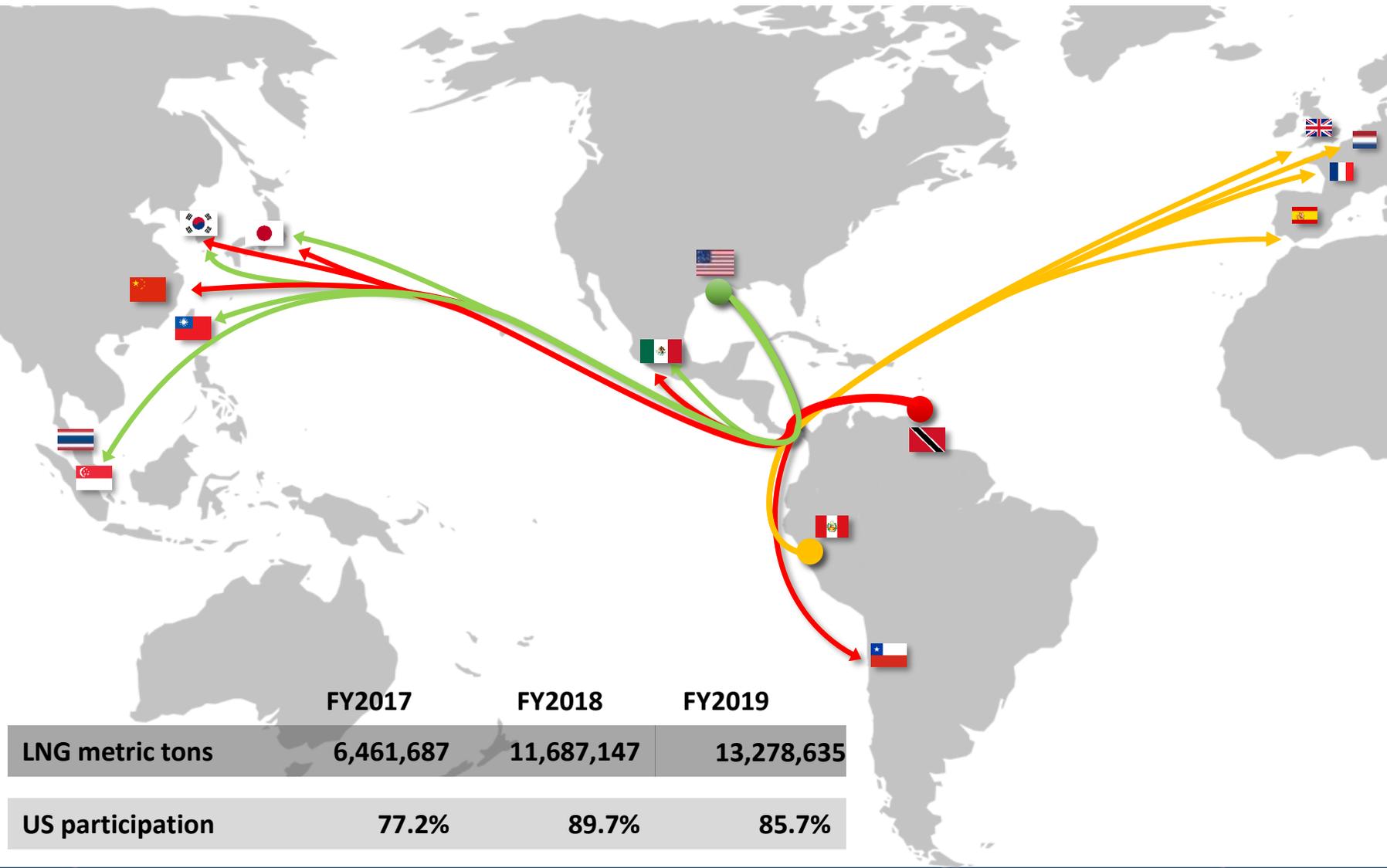
More Relevance of Energy Products: LPG Flows (Fiscal year 2019)



	FY2017	FY2018	FY2019
LPG metric tons	15,565,040	18,518,677	20,000,421
US participation	89.0%	91.5%	92.3%

Origin	Destination	Metric Tons
US 92.3%	JAPAN	10,532,892
	SOUTH KOREA	2,751,065
	CHILE	1,038,387
	ECUADOR	1,025,737
	MEXICO	672,699
	TAIWAN	350,556
	SINGAPORE	335,620
	AUSTRALIA	328,545
	OTHERS	287,261
Trinidad & Tobago 6.5%	MEXICO	770,364
	SOUTH KOREA	368,117
	CHILE	129,987
	OTHERS	25,681
Others		240,302
Total		20,000,421

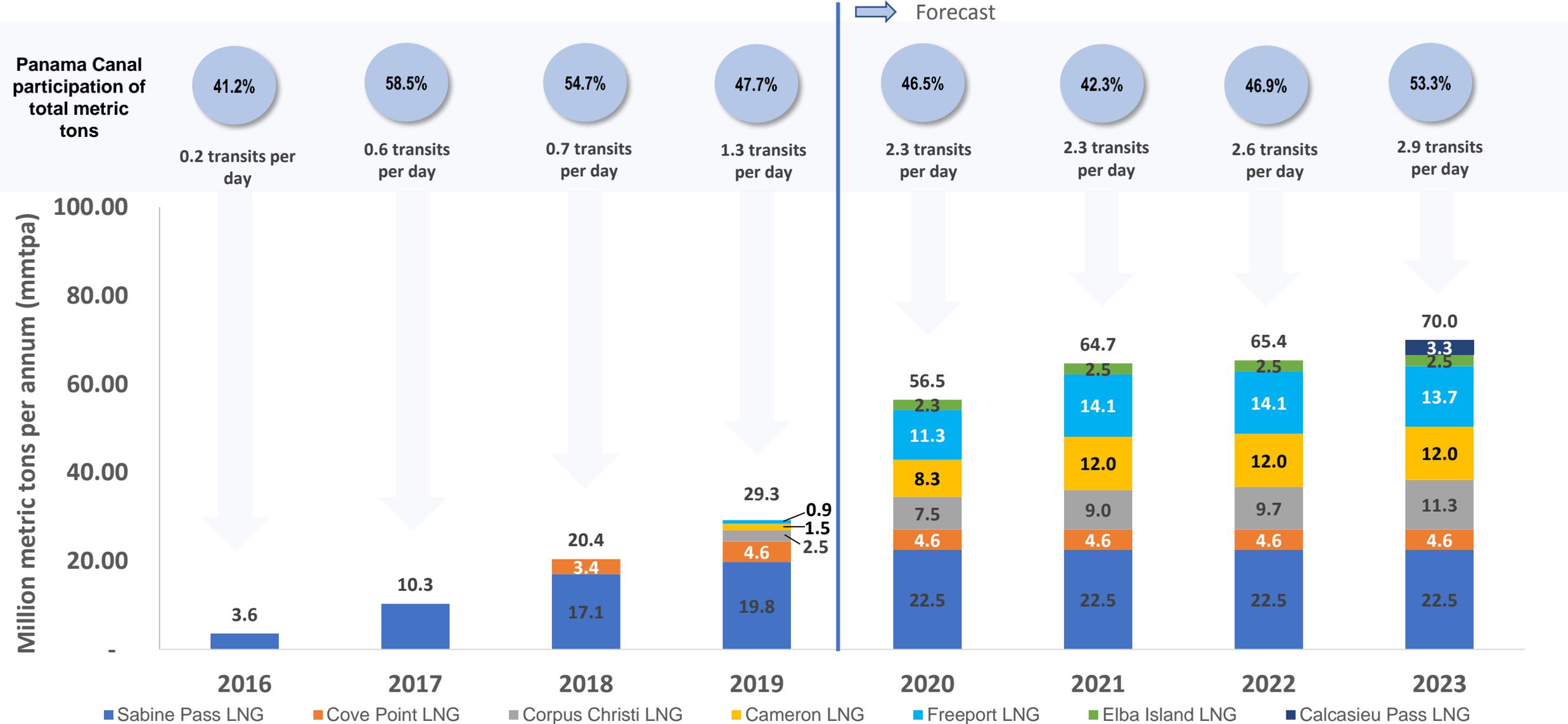
More Relevance of Energy Products: LNG Flows (Fiscal year 2019)



	FY2017	FY2018	FY2019
LNG metric tons	6,461,687	11,687,147	13,278,635
US participation	77.2%	89.7%	85.7%

Origin	Destination	Metric Tons
US 85.7%	SOUTH KOREA	4,347,218
	JAPAN	2,812,519
	MEXICO	1,999,324
	CHILE	1,315,674
	TAIWAN	349,340
	PANAMA	213,981
	CHINA	176,727
	SINGAPORE	100,271
	THAILAND	68,440
Trinidad & Tobago 7.0%	CHINA	381,988
	MEXICO	224,746
	CHILE	191,579
	SOUTH KOREA	74,295
	JAPAN	60,794
Peru 6.5%	FRANCE	280,764
	SPAIN	251,802
	NETHERLANDS	183,544
	UNITED KINGDOM	153,128
Others		92,500
Total		13,278,635

United States LNG Contracted Volumes and Total Transits through The Panama Canal



Source: IHS Markit and ACP Data Warehouse/Forecast

Al Safliya: Inaugural Transit



Vessel Type: LNG Q Flex

Customer: Qatar Gas

Total cargo capacity: 210,100 m³

LOA: 315.0 m

Beam: 50.05 m

Transit charges: \$513,750.93



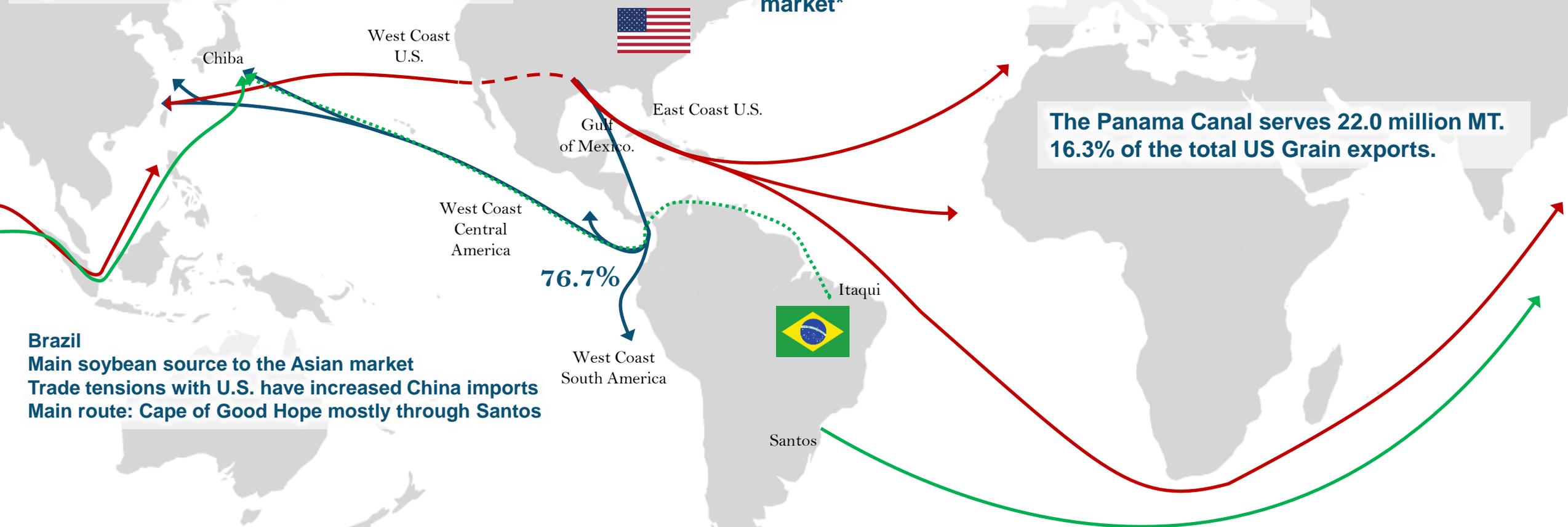
Panama Canal U.S. and Brazil Grain Market Share

Distance from Itaqui to Chiba, Japan.*

Route	Distance	Days
Panama Canal	10,218 nm	30 days
Cape of Good Hope	12,376 nm	37 days

In 2018, total relevant U.S. Grain Exports destined to Asia, West Coast Central and South America*: 28.7 million MT.
The Panama Canal serves 76.7% of the relevant market*

The Panama Canal serves 22.0 million MT.
16.3% of the total US Grain exports.



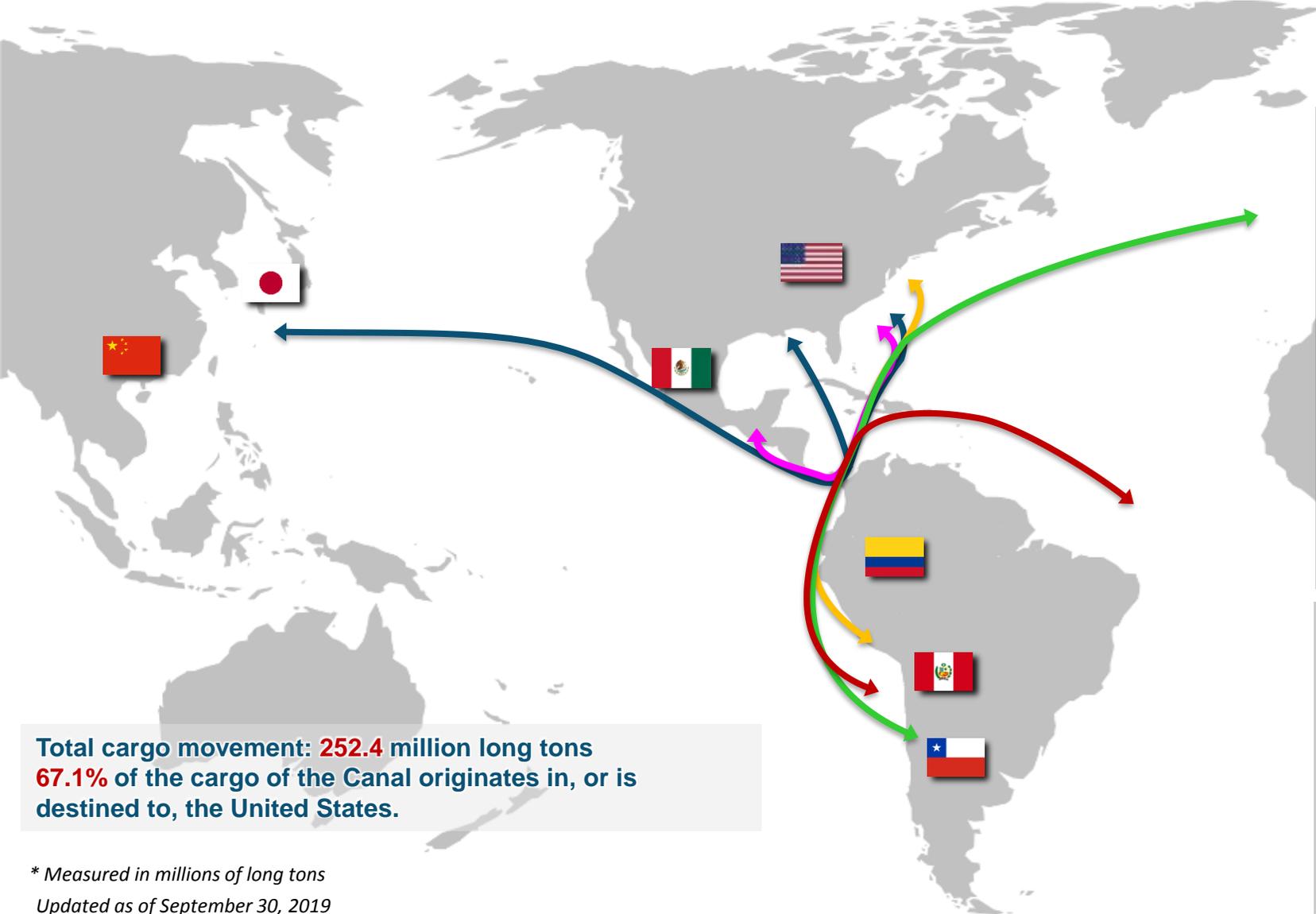
Brazil
Main soybean source to the Asian market
Trade tensions with U.S. have increased China imports
Main route: Cape of Good Hope mostly through Santos

76.7%

*Relevant market for the Panama Canal: ports located on U.S. East Coast and Gulf of Mexico to Northeast Asia (China, Japan, South Korea and Taiwan), West Coast of Central and South America, and flows from U.S. ports located on the Pacific to Europe.

*Source: Sea-distances.org, <https://sea-distances.org/>, speed: 14 knots, distance in nautical miles (nm)

Protectionism and Trade Conflicts: Implications for The Panama Canal



Total cargo movement: **252.4** million long tons
67.1% of the cargo of the Canal originates in, or is destined to, the United States.

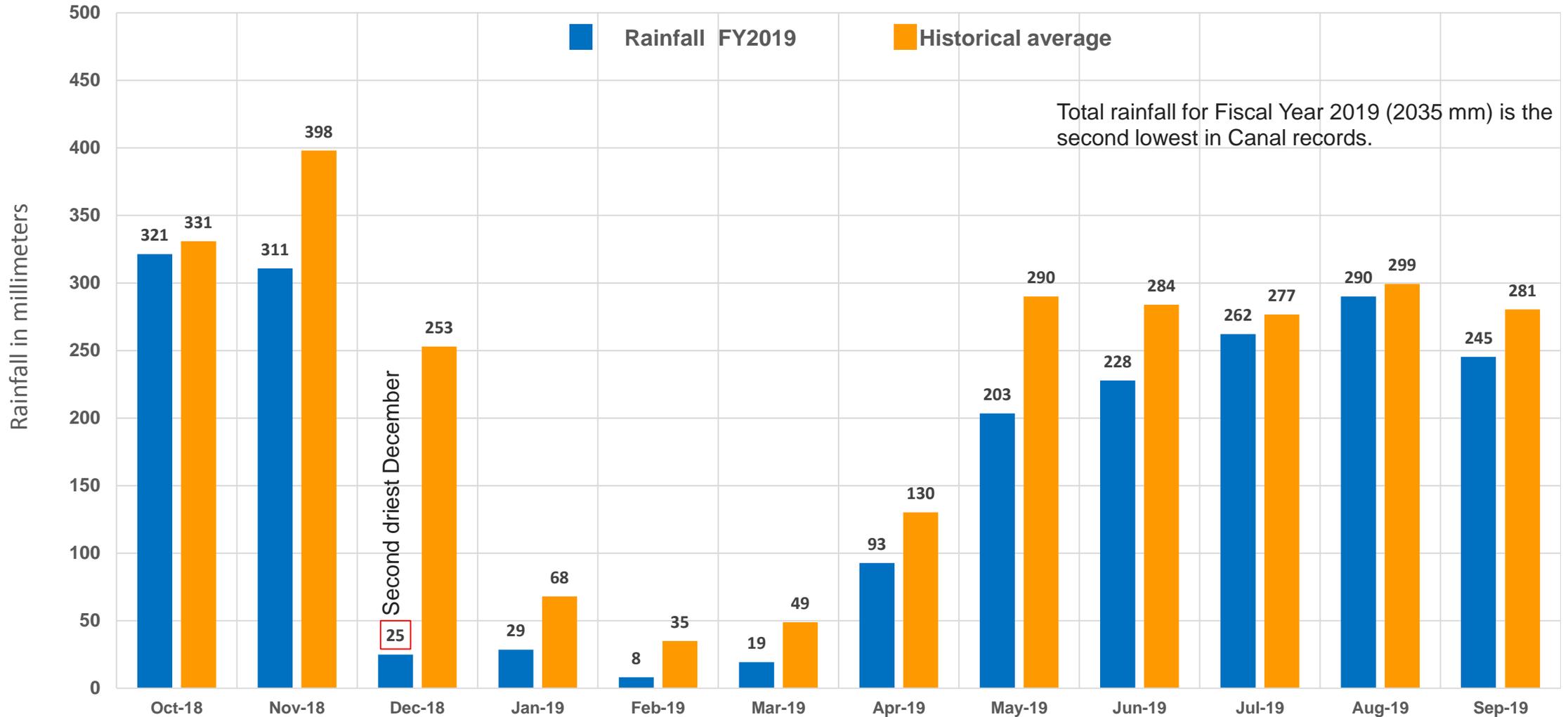
** Measured in millions of long tons
 Updated as of September 30, 2019*

Total Cargo Movements		
User	FY 2018*	FY 2019*
Unites States	174.9	169.5
China	41.6	34.2
Japan	30	34.1
Chile	30.4	30.5
Mexico	30.4	28.8
South Korea	23.5	25.9
Colombia	23.7	23.7

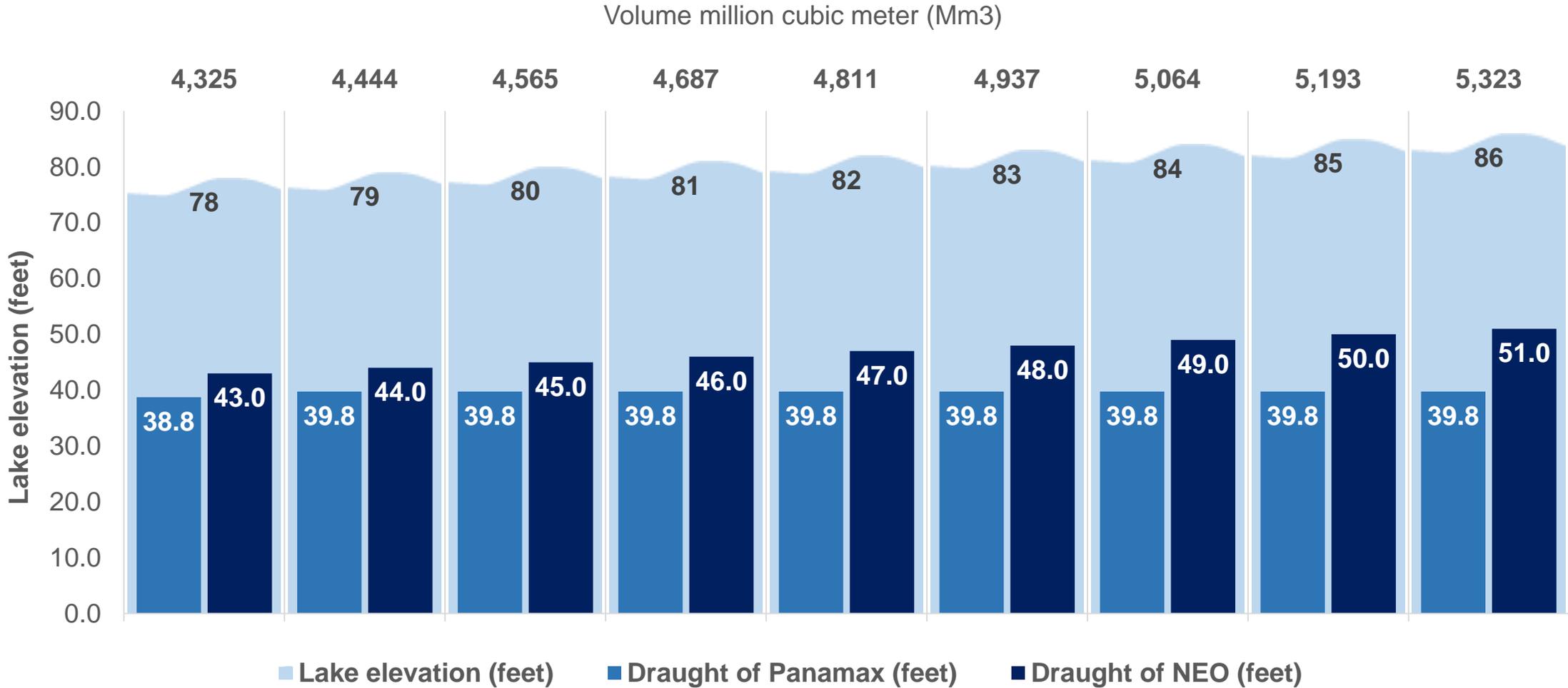
Main Routes - FY 2019		
Asia – US East Coast	↔	83.8M
South America West Coast – US East Coast	↔	37.0M
Central America West Coast – US East Coast	↔	20.8M
South America West Coast - Europe	↔	15.9M
South America Coast to Coast	↔	9.5M

Climate Change Reality

Monthly rainfall levels in the Panama Canal Watershed
Fiscal Year 2019



Water Resources Management: Gatun Lake Elevation vs Water Volume in Mm3



2' under keel clearance (UKC)
13.3' Lake Miraflores + 79'
37.3' Sill PM and GT locks – 79'

5' under keel clearance (UKC)
30' PLD Channel bottom

Considerations for IMO 2020

NT NOTICE TO SHIPPING No. N-1-2019

NT Notice to Shipping N-1-2019

Vessel Requirements

same place condition for the ballast water is void. Consequently, their ballast water will be considered high risk to their new location and shall not be discharged until properly managed as per the vessel's BWMP.

h. Disposal of tank sediment is strictly prohibited in water bodies under the responsibility of the Panama Canal. Eductors are not permitted to strip ballast tanks, unless a vessel seeks permission from the Canal Port Captain to discharge sediment to a reception facility.

i. The Ballast Water Record Book (BWRB) and the Ballast Water Management Plan (BWMP) shall be available for inspection by the Panama Canal authorities on request.

28. Discharging of Vessel Wastes, Oily Bilge Water and Ballast Water

In compliance with ACP Sanitation Regulations, Article 40:

(1) Vessels shall not discharge or throw into Panama Canal waters any ballast, ashes, boxes, barrels, straw, paper or other solid matter, including garbage; nor discharge heavy slops, engine or fire room bilge water, oil, radioactive substances, or any other contaminating substances.

(2) Before arrival at a port in Canal waters, vessels shall dispose of all waste in a manner consistent with the requirements of the International Convention for the Prevention of Pollution from Ships 73/78 (MARPOL) and all amendments thereto. If unable to dispose of waste at sea, vessels may use the services available for such purpose.

(3) Incineration of wastes on board ships is specifically prohibited in Canal waters, in compliance with MARPOL, Article 5 of the 1996 Protocol.

(4) Heating of contents in the sludge tanks is prohibited from two hours prior to the pilot boarding time and during the entire transit.

(5) Residues from the Exhaust Gas Cleaning System (EGCS) washwater are to be collected on board. Discharging these residues into the water bodies under the responsibility of the Panama Canal or incinerating them on board is not permitted.

(6) If a Closed Loop Scrubber system is operated during Canal transit, the cleaned bleed-off water is to be retained in a holding tank on board.

NT Notice to Shipping N-1-2019

Vessel Requirements

b. Requirements for vessels with intention to transit the Panama Canal

- (1) Vessels operating their main propulsion and auxiliary equipment on heavy fuel oil shall switch over to light fuel prior to arrival into water bodies under the responsibility of the Panama Canal Authority. The outer boundaries of Canal waters are those of the Pacific and Atlantic anchorage areas, as indicated in nautical charts DMA No.21603 and DMA No.26068 respectively.
- (2) Vessels that need to wait at anchor at the Pacific or Atlantic Anchorages prior to the transit will be permitted to use heavy fuel to operate their auxiliary generator engines, boilers and other ancillary equipment during their stay at the anchorage. This permission does not apply to the main propulsion engines.
- (3) Vessels that opt to burn heavy fuel in their auxiliary generator engines, boilers and other ancillary equipment during their stay at the anchorage, as described in the above paragraph, shall switch over to light fuel operation, at least two (2) hours prior to the scheduled pilot time for their Canal transit. Vessels will be deemed ready for Canal transit only when the changeover to light fuel has been completed and are operating on light fuel only.
- (4) Operating the main engines on heavy fuel is deemed a deficiency, and as such, the vessel will not be deemed ready nor permitted to transit until the switch over to light fuel oil have been completed and the main propulsion engines are ready for maneuvers.
- (5) Vessels operating on liquefied natural gas, methanol and low-sulfur hybrid fuels are not required to change over to light fuel.
- (6) Liquefied Natural Gas (LNG) Carriers may opt to use boil off gas (BOG) to fuel their propulsion engines or power generators while maneuvering in Canal waters.
- (7) Vessels are not required to changeover to light fuel on their propulsion engines if equipped with a type-approved closed-loop exhaust gas cleaning system (scrubbers) kept in operation; during the entire transit. The date and time of the period of operation of this equipment shall be recorded in the engine room logbook.
- (8) Vessels shall record the fuel changeover in their engine room logbook and/or fuel oil changeover record book. The record book entries shall specify the date and time of commencement and ending of the changeover from heavy fuel to light fuel, as well as the sulfur content of fuels.

Vessel Requirements



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