Panama Canal Expansion

Ag Transportation Summit– Rosemont, Illinois

July 30-31, 2013

María Eugenia de Sánchez
Panama Canal Authority

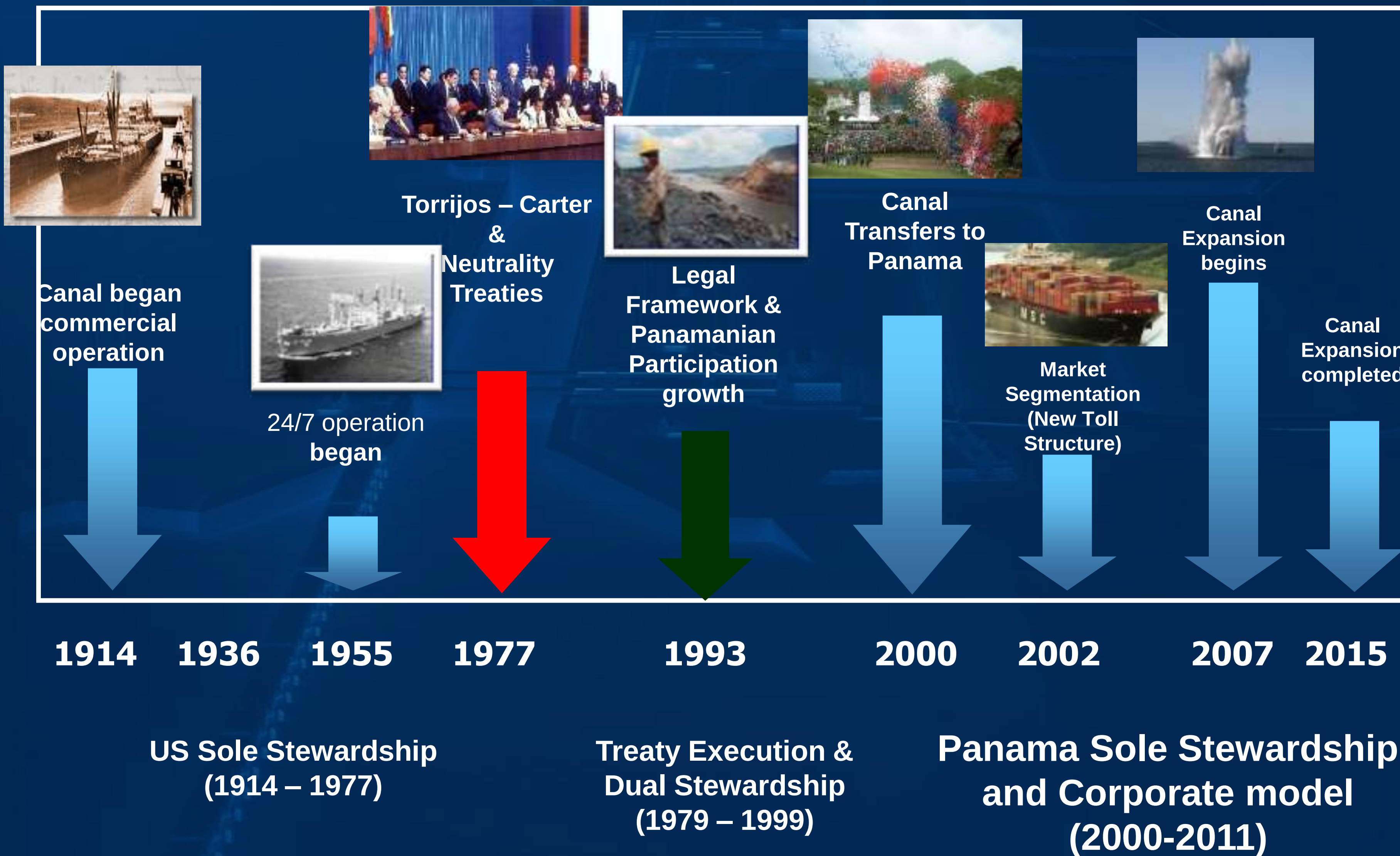
CANAL DE PANAMÁ

Agenda

- Canal Traffic performance
- Grain cargo through the Panama Canal
- Panama Canal Expansion program
- Conclusion

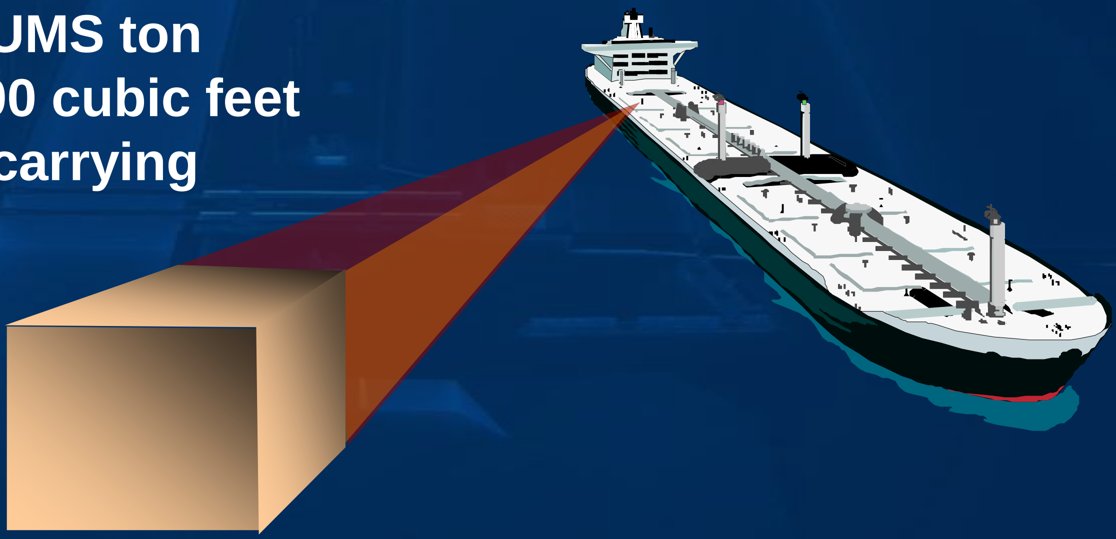
Canal Traffic performance

Panama Canal Milestone Timeline

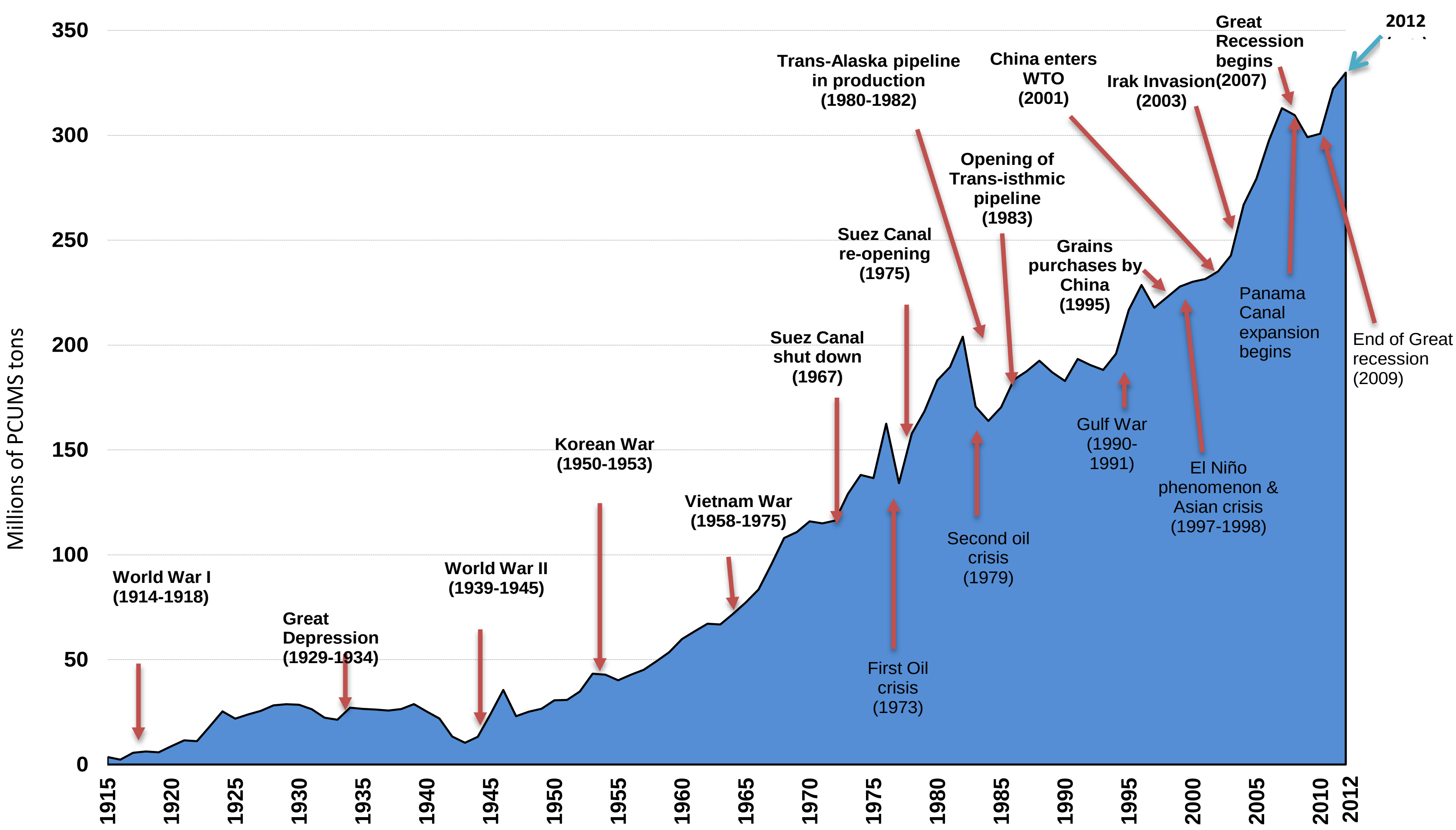


Panama Canal Universal Measurement System (PC/UMS)

One PC/UMS ton equals 100 cubic feet of cargo carrying capacity



Evolution of Panama Canal Vessel Tons (million PCUMS tons)



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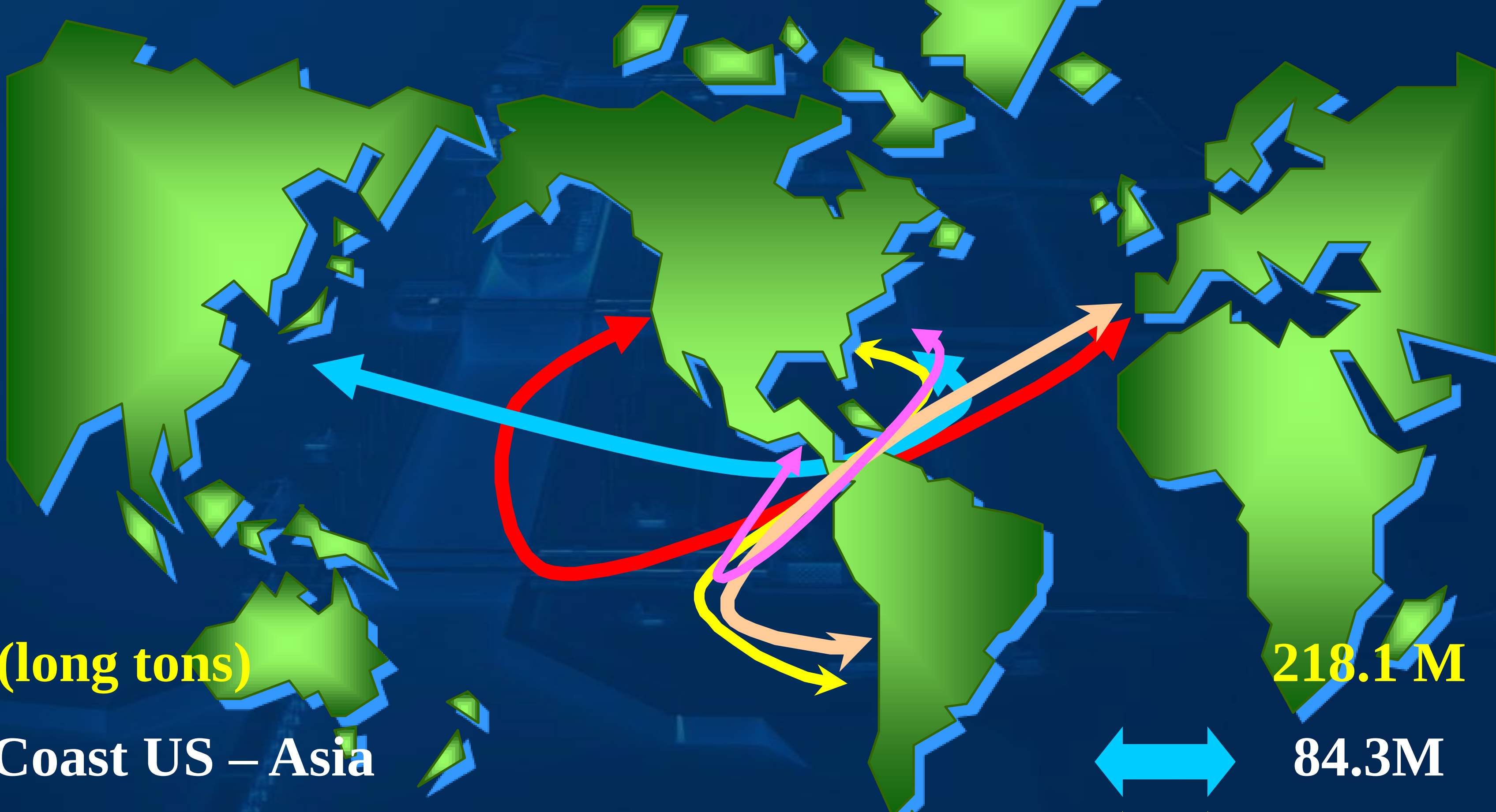
Cargo Types
(millions of long tons)
october – september FY 2006 – 2012

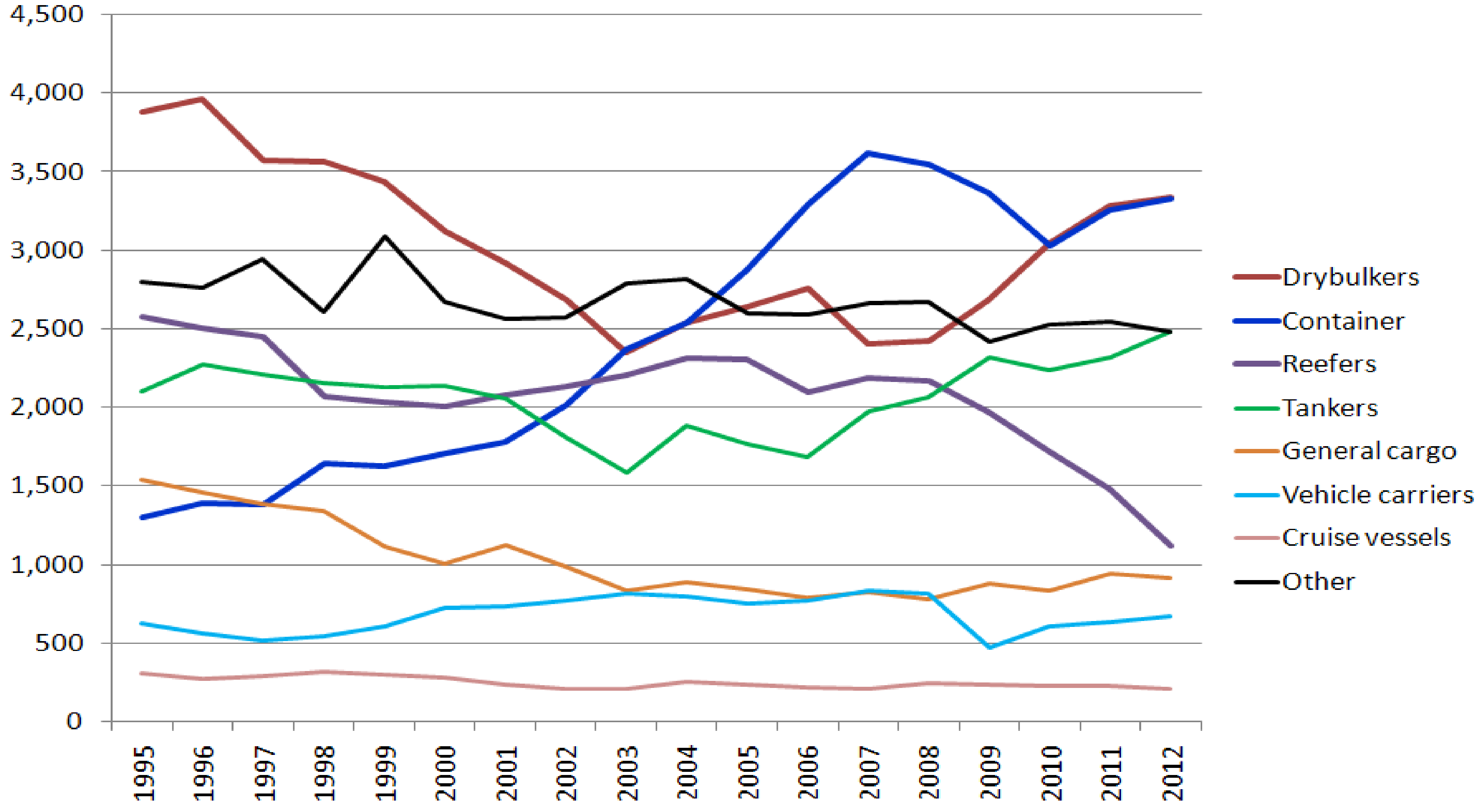
Commodities	2006	2007	2008	2009	2010	2011	2012
Containerized cargo	53.7	58.6	61.3	51.5	51.0	54.6	52.2
Grains	36.7	33.0	31.0	36.2	40.4	40.3	37.0
Petroleum and products	31.1	32.1	35.2	37.4	34.8	35.7	38.9
Ores and metals	14.6	14.7	12.3	11.0	12.0	17.4	18.7
Coal	5.7	6.2	11.3	8.0	10.5	14.2	14.1
Chemicals and petrochemicals	13.7	13.4	13.1	13.7	12.3	13.1	12.6
Salt and minerals	4.8	4.1	5.1	8.2	8.1	8.6	7.0
Iron ore and steel manufactures	7.3	7.2	6.8	5.3	5.3	6.5	5.6
Fertilizers	6.3	5.7	5.3	4.8	6.4	6.4	6.6
Machinery and equipment	4.6	4.8	4.5	3.1	3.8	4.0	5.0
Refrigerated products	5.1	5.1	5.0	4.6	4.0	3.6	2.9
Lumber and products	5.9	5.1	3.9	2.9	3.1	3.2	2.8
Others	22.2	18.4	14.8	11	13.2	14.8	14.9
TOTAL	**211.6**	**208.2**	**209.8**	**197.9**	**204.9**	**222.4**	**218.1**

Main Routes - FY 2012



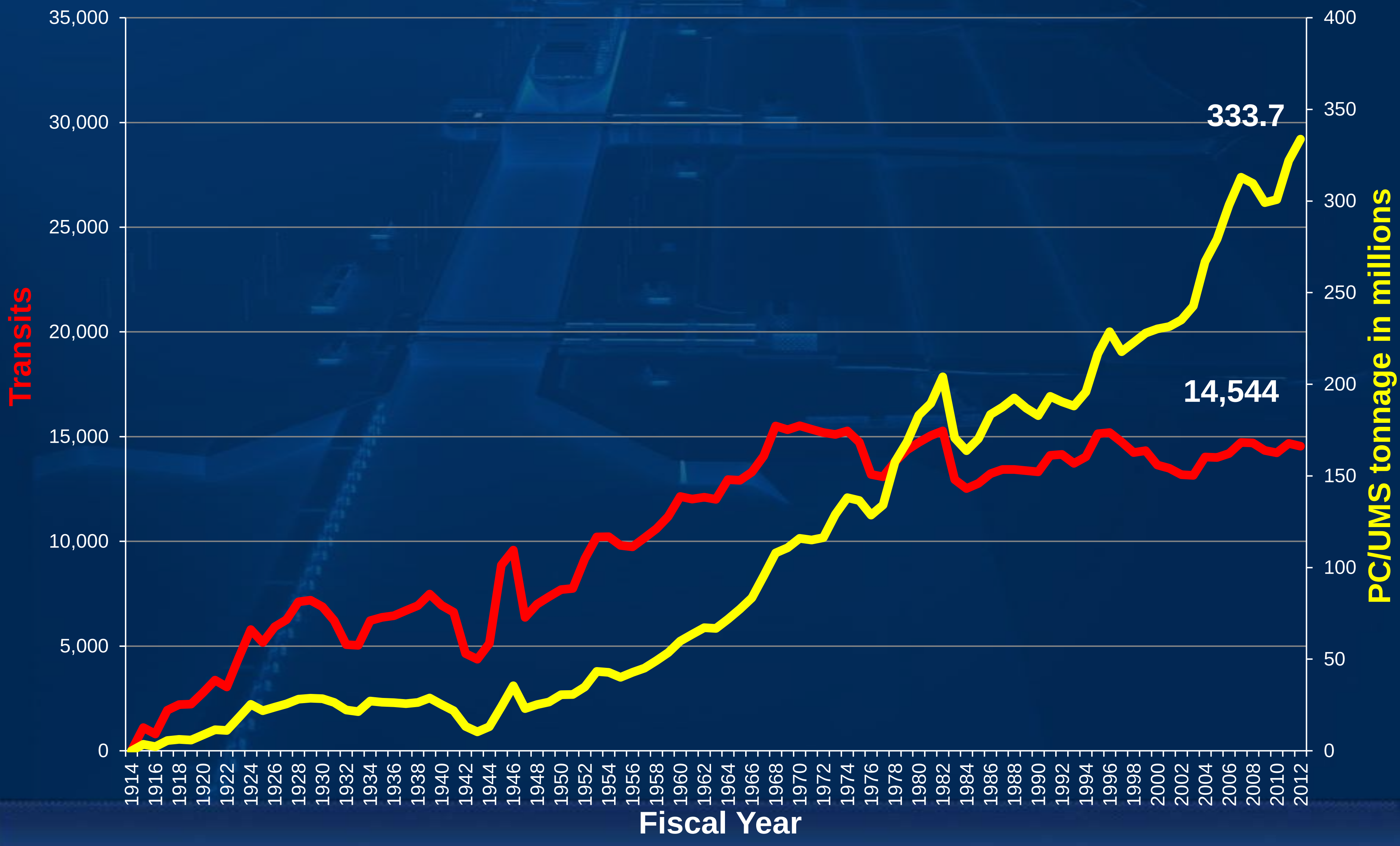
Total (long tons)	**218.1 M**
East Coast US – Asia	84.3M
West Coast South America — East Coast US	27.6M
West Coast South America — Europe	14.4M
West Coast US — Europe	9.7M
West Coast Central America — East Coast US	12.2M

Transits by vessel type



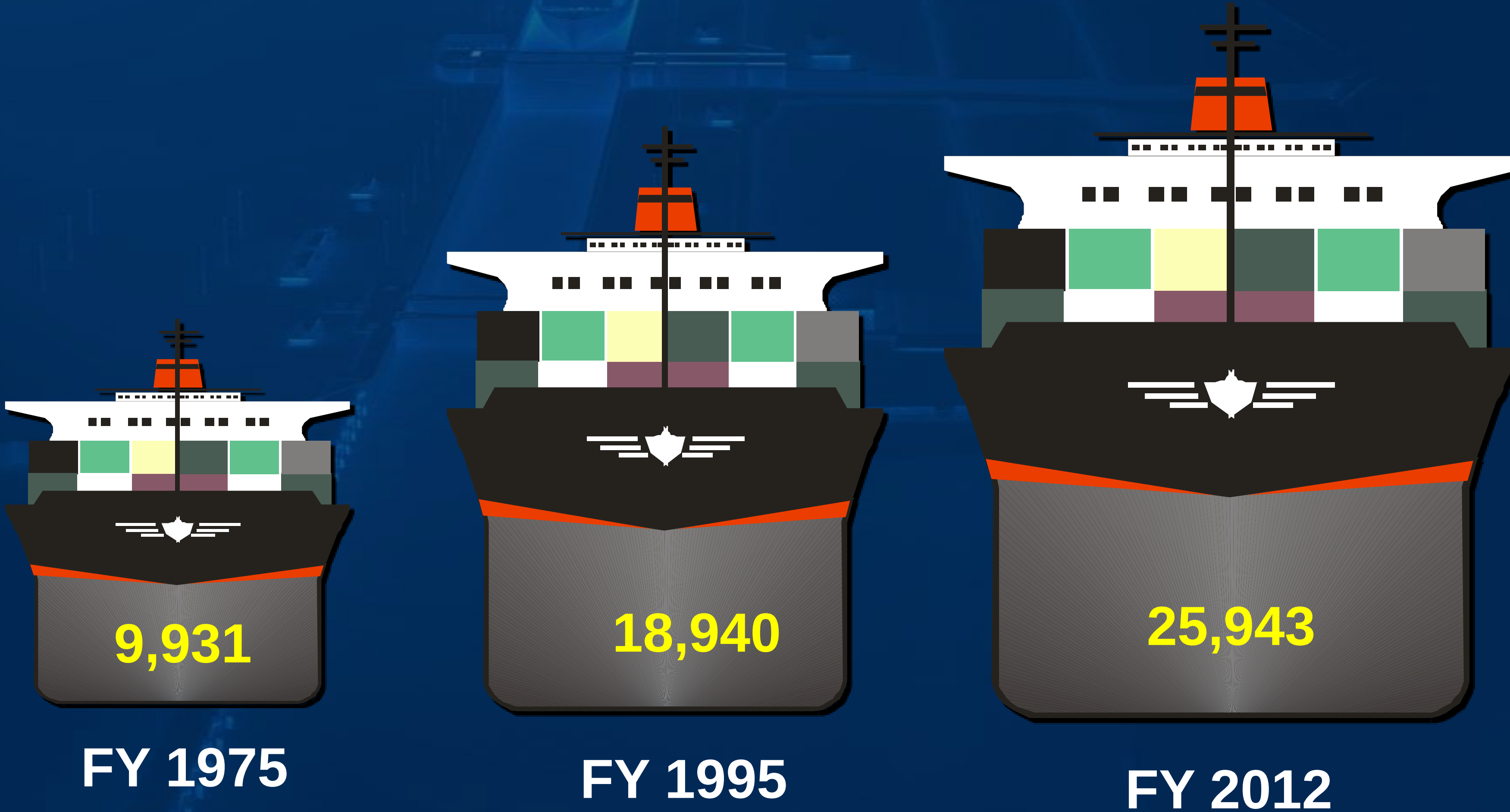
Source: ACP database

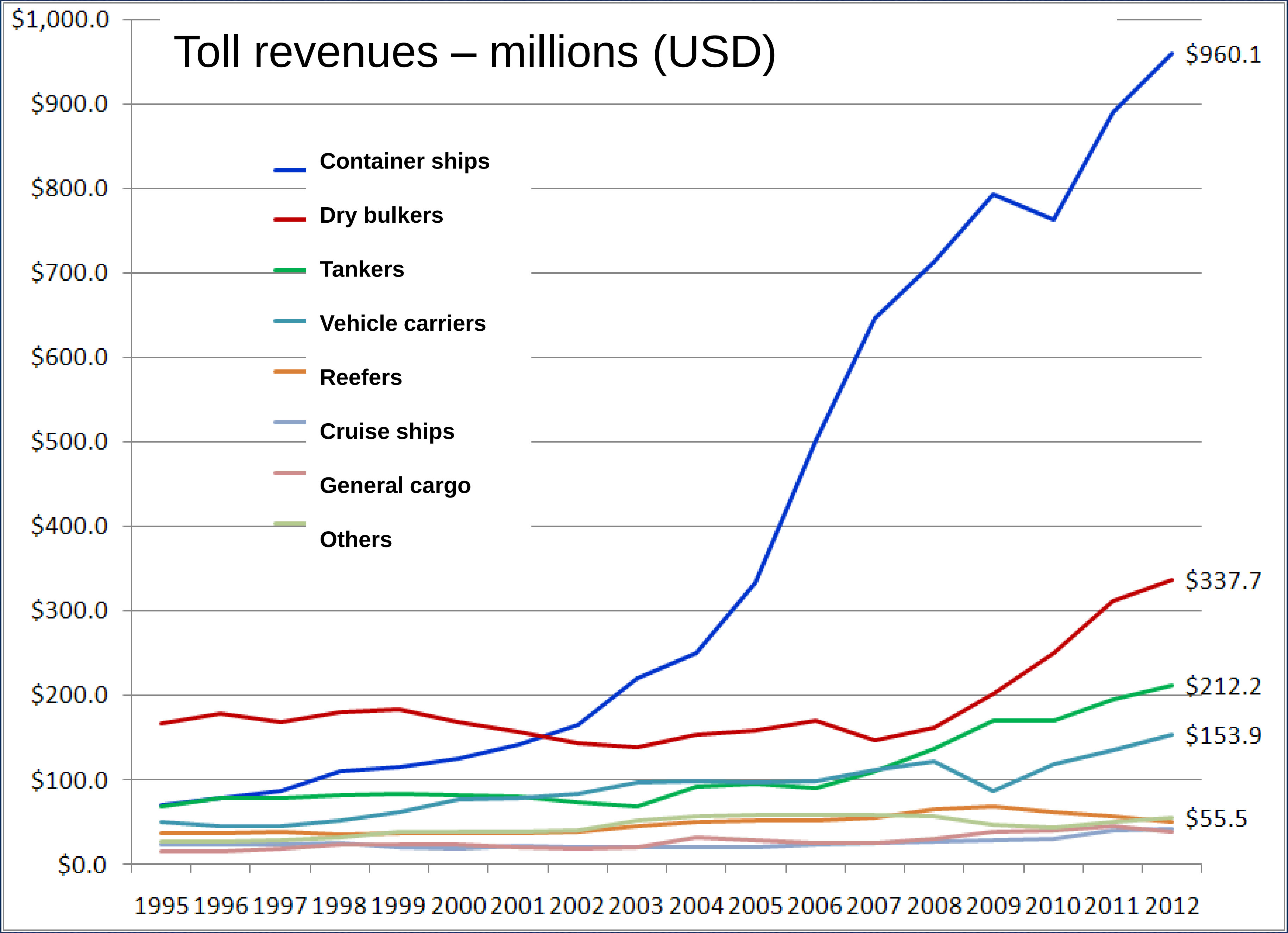
Transits vs PC/UMS Tonnage
FY 1914 – FY 2012

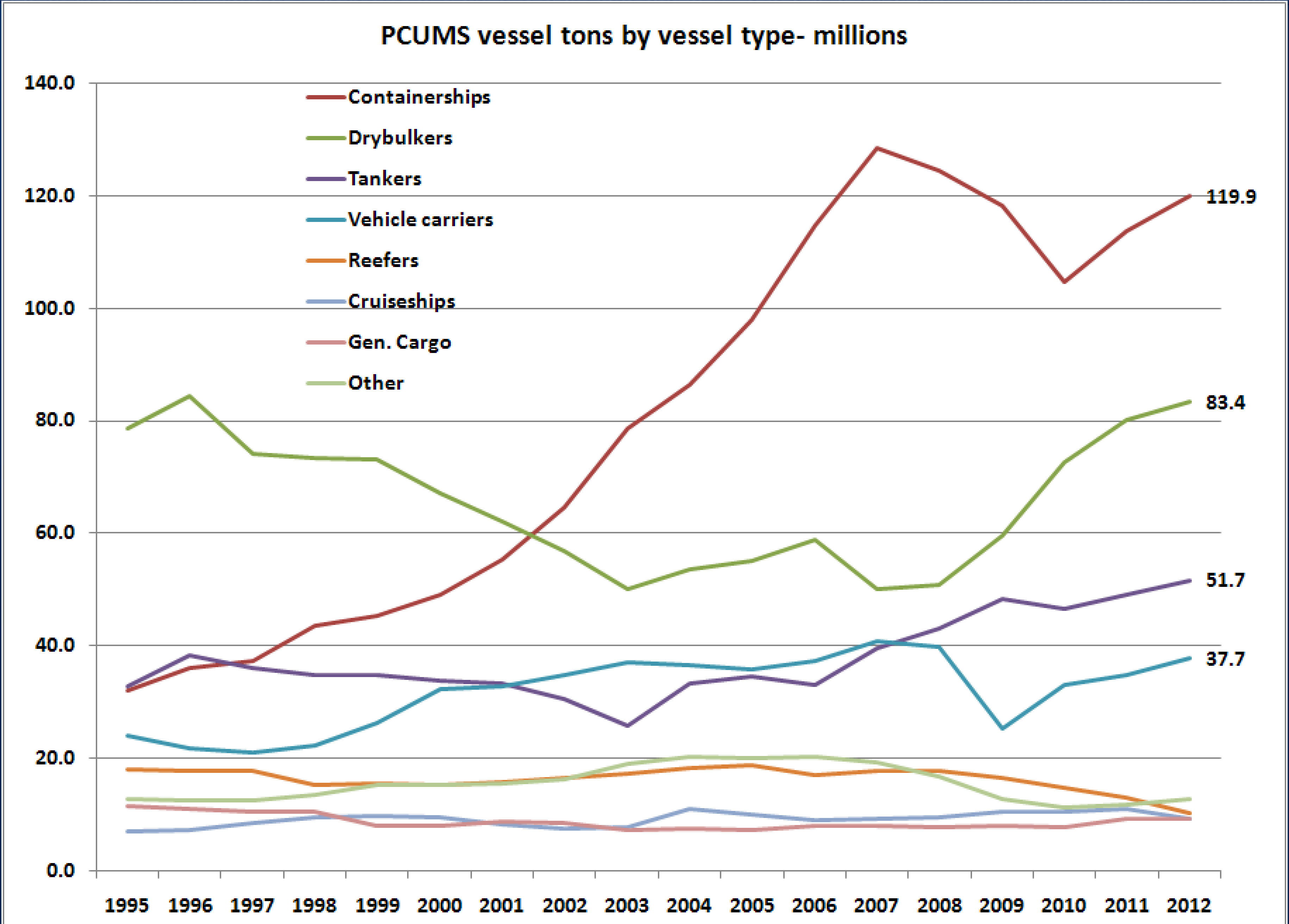


Average Vessel Tonnage (PC/UMS tons)

Oceangoing Vessels




Toll revenues – millions (USD)
Container ships
Dry bulkers
Tankers
Vehicle carriers
Reefers
Cruise ships
General cargo
Others
$1,000.0
$900.0
$800.0
$700.0
$600.0
$500.0
$400.0
$300.0
$200.0
$100.0
$0.0
$960.1
$337.7
$212.2
$153.9
$55.5
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012


PCUMS vessel tons by vessel type- millions
Containerships
Drybulkers
Tankers
Vehicle carriers
Reefers
Cruiseships
Gen. Cargo
Other
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
119.9
83.4
51.7
37.7
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012

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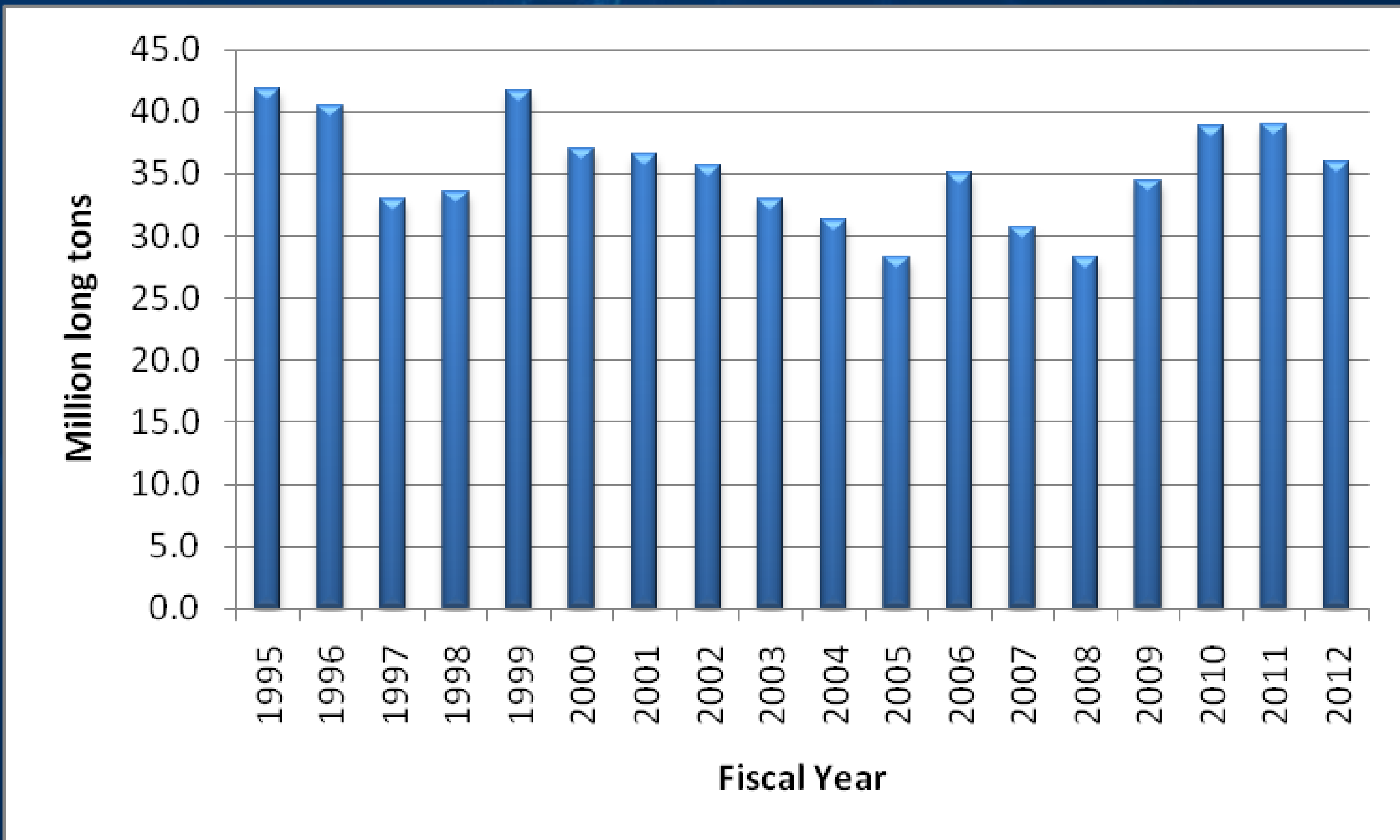
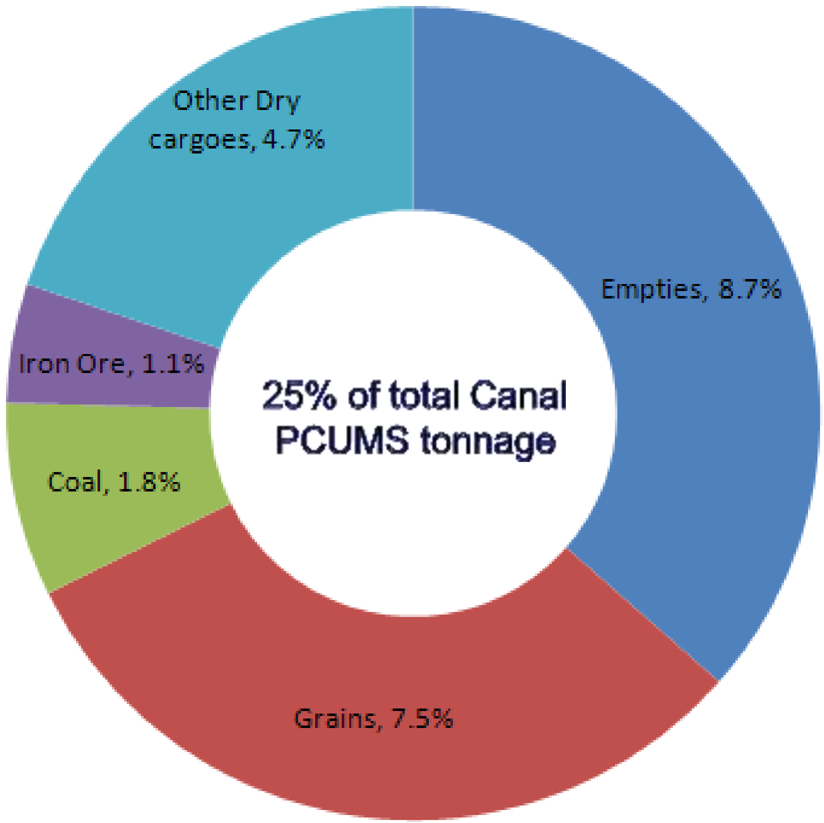
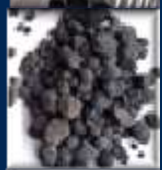
Grain Cargo through the Panama Canal

Grain cargo is the most important dry cargo through the Panama Canal. It accounts for 16% of Canal cargo.



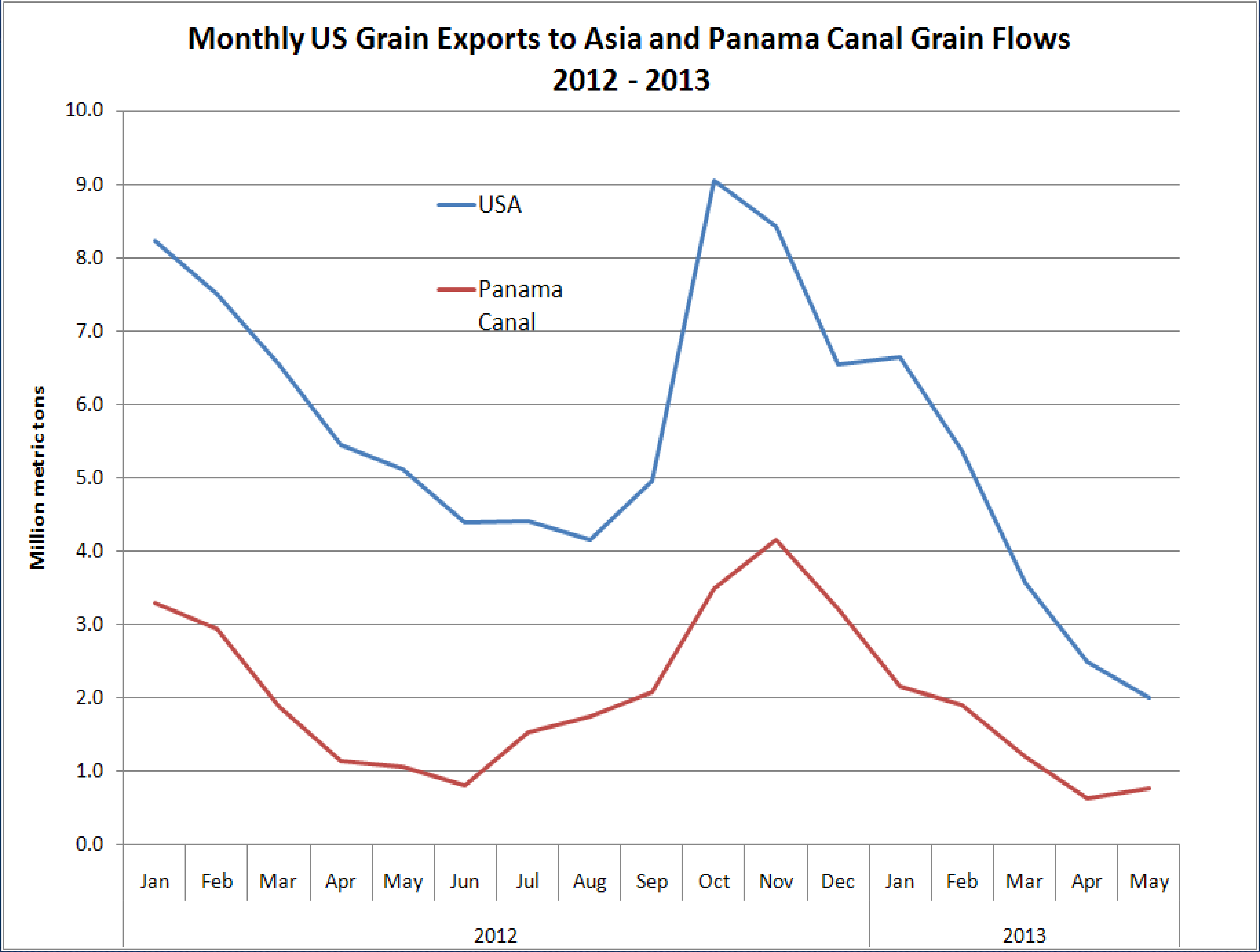
Dry Cargoes in Total Canal– FY 2012

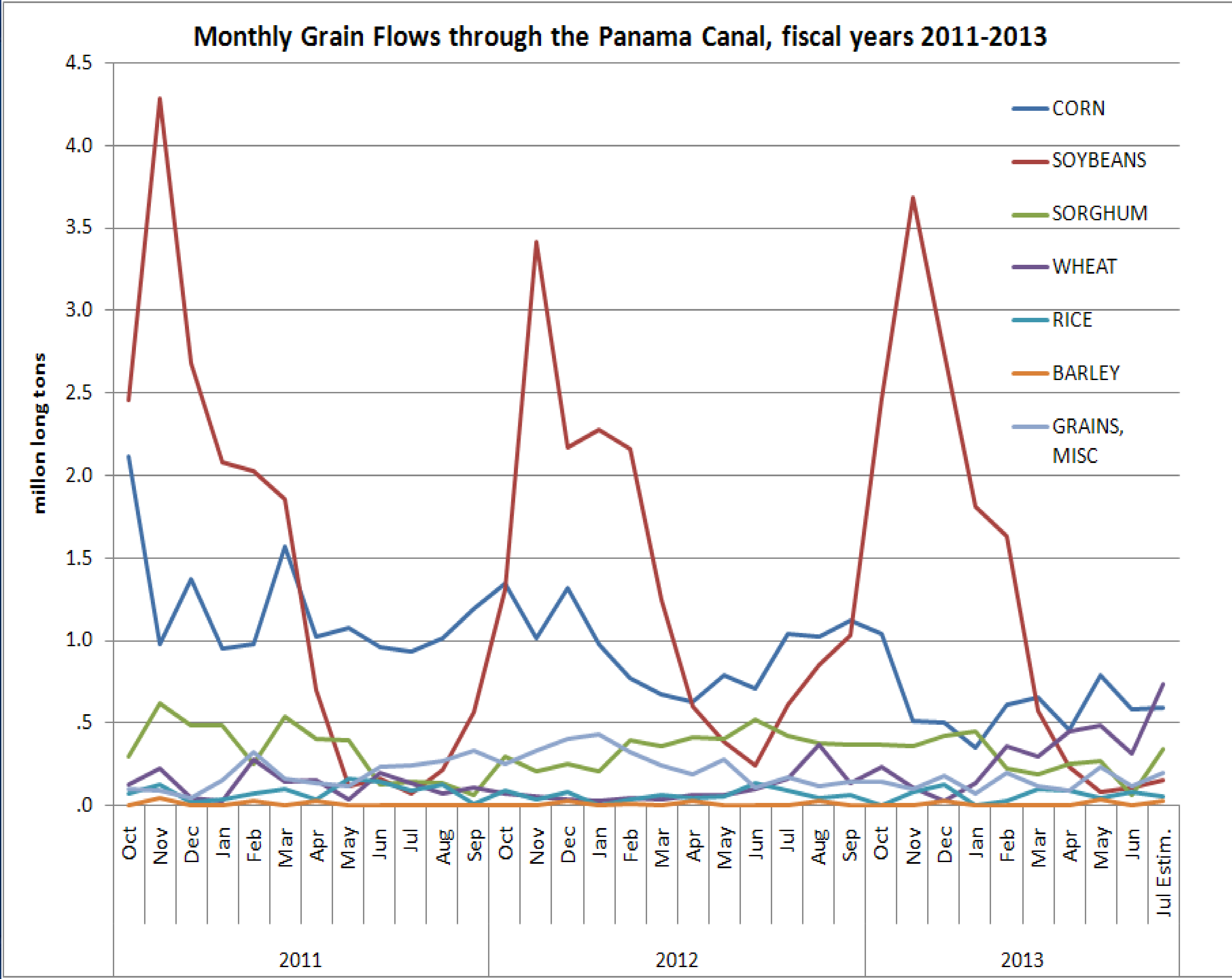




Average Indicators for Vessels Carrying Grains

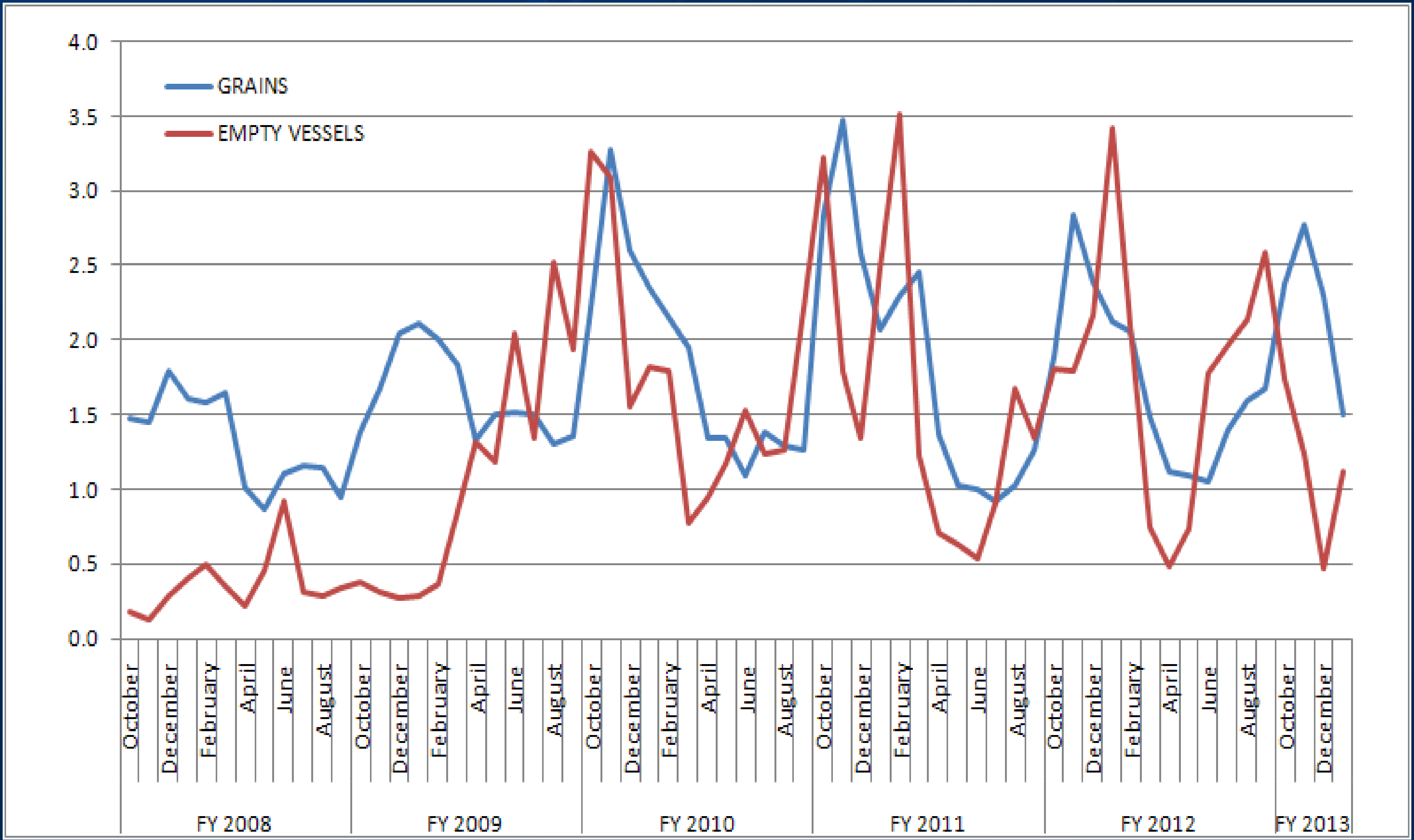
DWT	Cargo	PCUMS ton	Toll Revenues	Other Marine Charges	Total Canal Charges	$ per ton
67,104	52,215	30,005	137,302	25,000	162,302	3.11


Monthly US Grain Exports to Asia and Panama Canal Grain Flows
2012 - 2013
Million metric tons
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
USA
Panama Canal
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
2012
2013

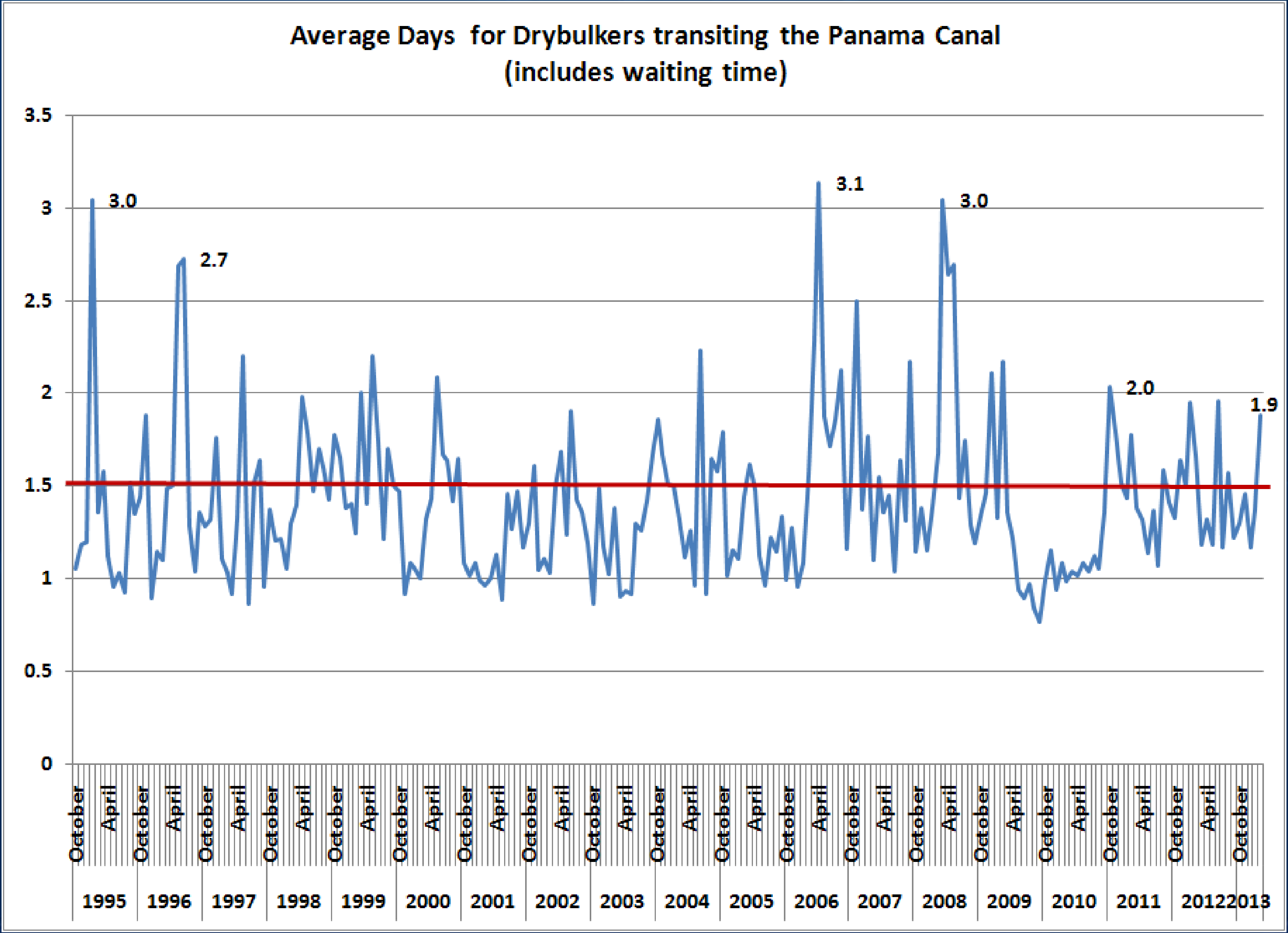


Monthly Grain Flows through the Panama Canal, fiscal years 2011-2013
millon long tons
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
.5
.0
CORN
SOYBEANS
SORGHUM
WHEAT
RICE
BARLEY
GRAINS, MISC
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Jul Estim.
2011
2012
2013

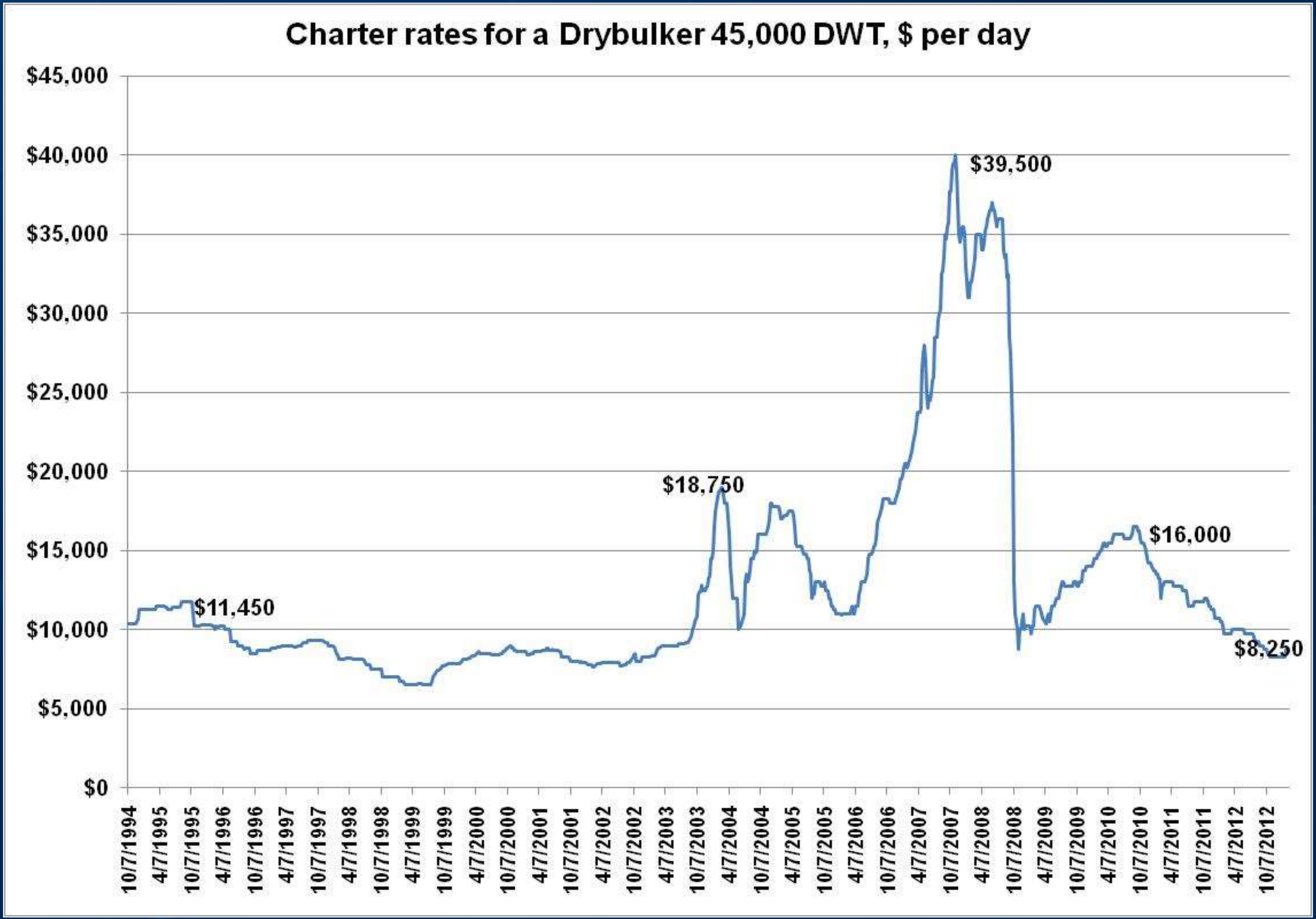
Vessel Tonnage related to Grains and Empty Vessels



Delays for drybulkers are more often on peak months



Delays impact because of vessel costs per day



Source: Clarkson Research Studies

Modernization and Expansion Program

Regular Investment Program

Accumulated Investment – Capex

(USD millions)

Dredging

Bridge over Atlantic side

FY 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
102	109	139	113	137	150	162	115	167	68	98	188	321	638

New visitor's center in Atlantic side

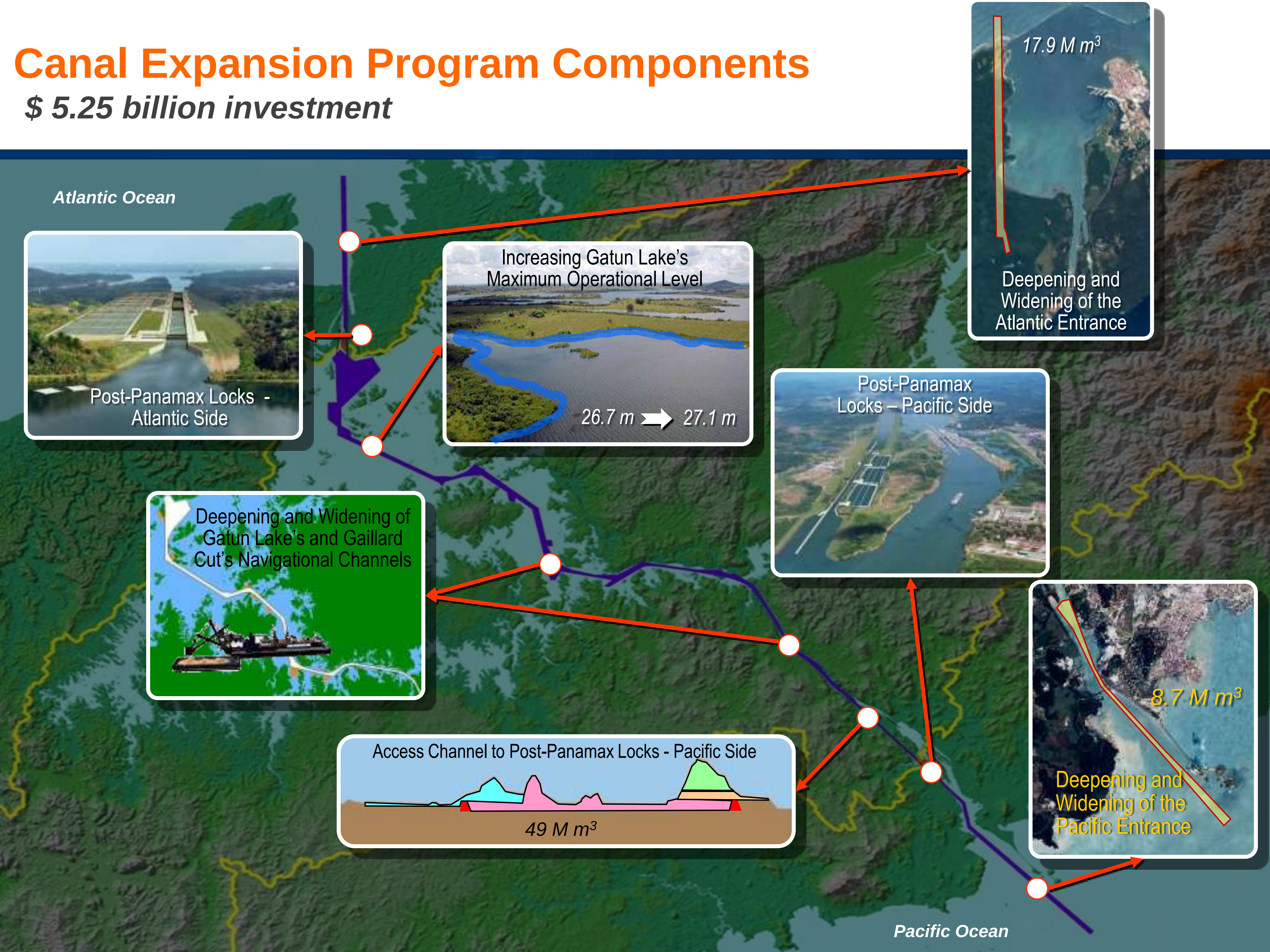
Ground dams

Hidraulic dredge

Tugboats

Canal Expansion Program Components

$ 5.25 billion investment



Expansion Program Progress

Pacific Access Channel

42.8 M m³ excavated and dredged / 49 M m³

End of last Contract: 31-Oct-2013

Pacific Entrance Deepening and Widening

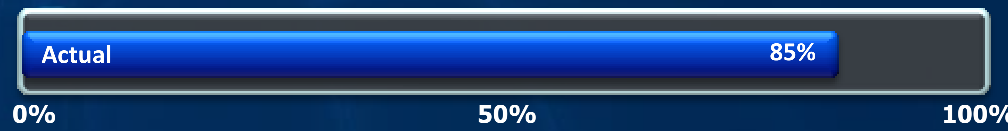
8.6 M m³ dredged

End of Contract: 31-Aug-2012

Gatun Lake and Culebra Cut Deepening and Widening

21.6 M m³ dredged / 26.5 M m³

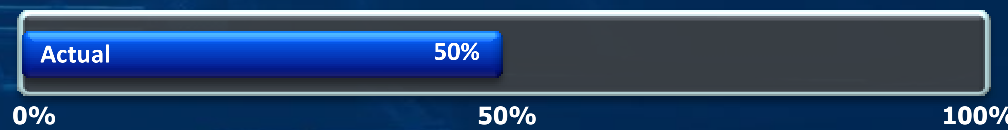
End: 11-Apr-2014



Locks Design and Construction

37.9 M m³ excavated / 47.5 M m³

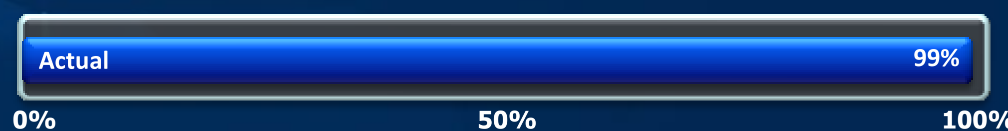
End of Contract: 21-Oct-2014



Atlantic Entrance Deepening and Widening

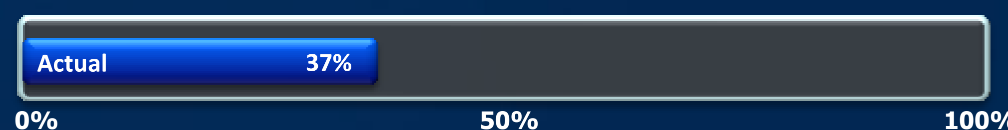
17.6 M m³ dredged / 17.6 M m³

End of Contract: 24-Apr-2013



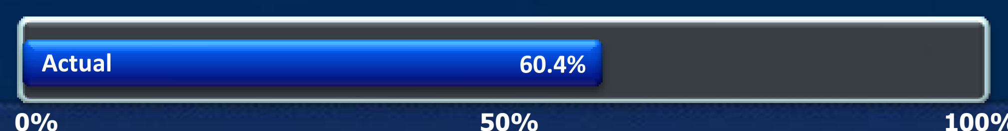
Raising Gatun Lake's Maximum Operational Level

End: 30-Sep-2013

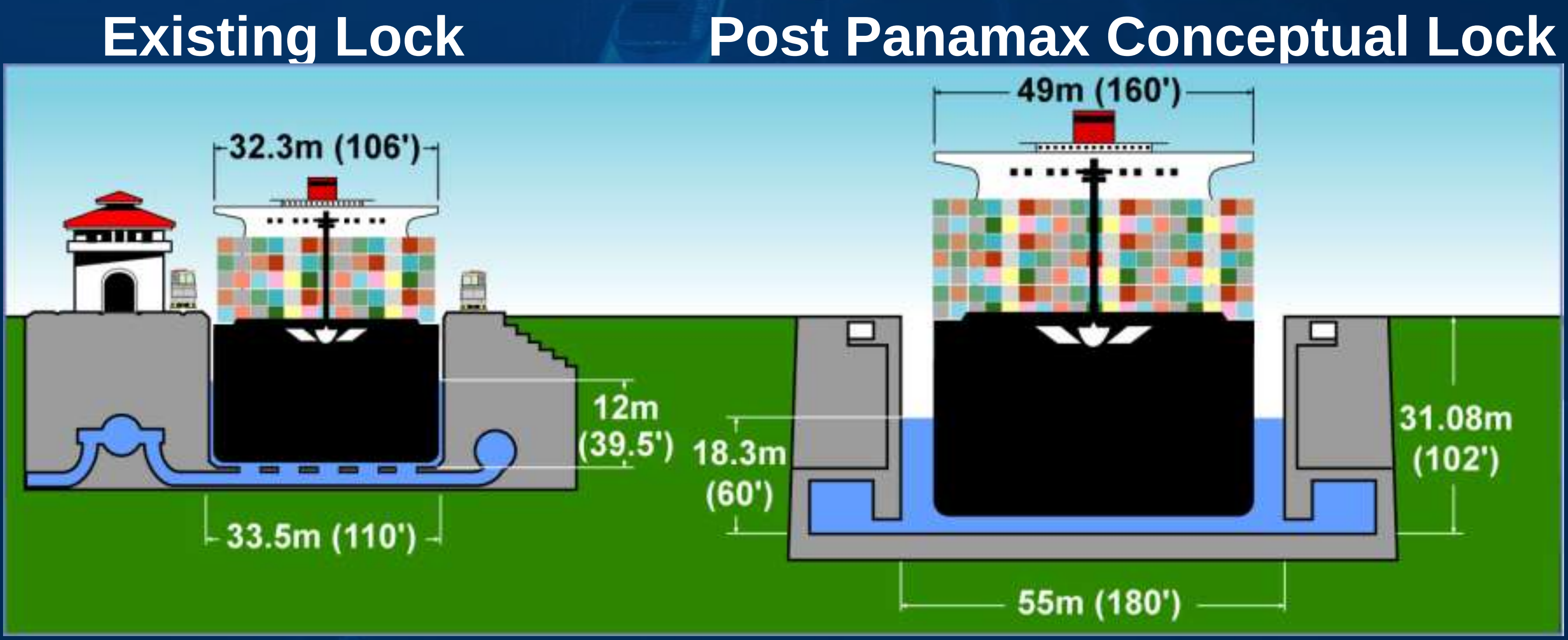


Expansion Program

Material removed:
128.5 M m³ / 148 M m³



Dimension of Vessels and Post Panamax Locks



Length of lock chamber 305m (1,000')

Maximum Ship beam 32.3m (106')

Maximum Ship length 294.3m (965')

Maximum ship draft 12.04 m (39.5')

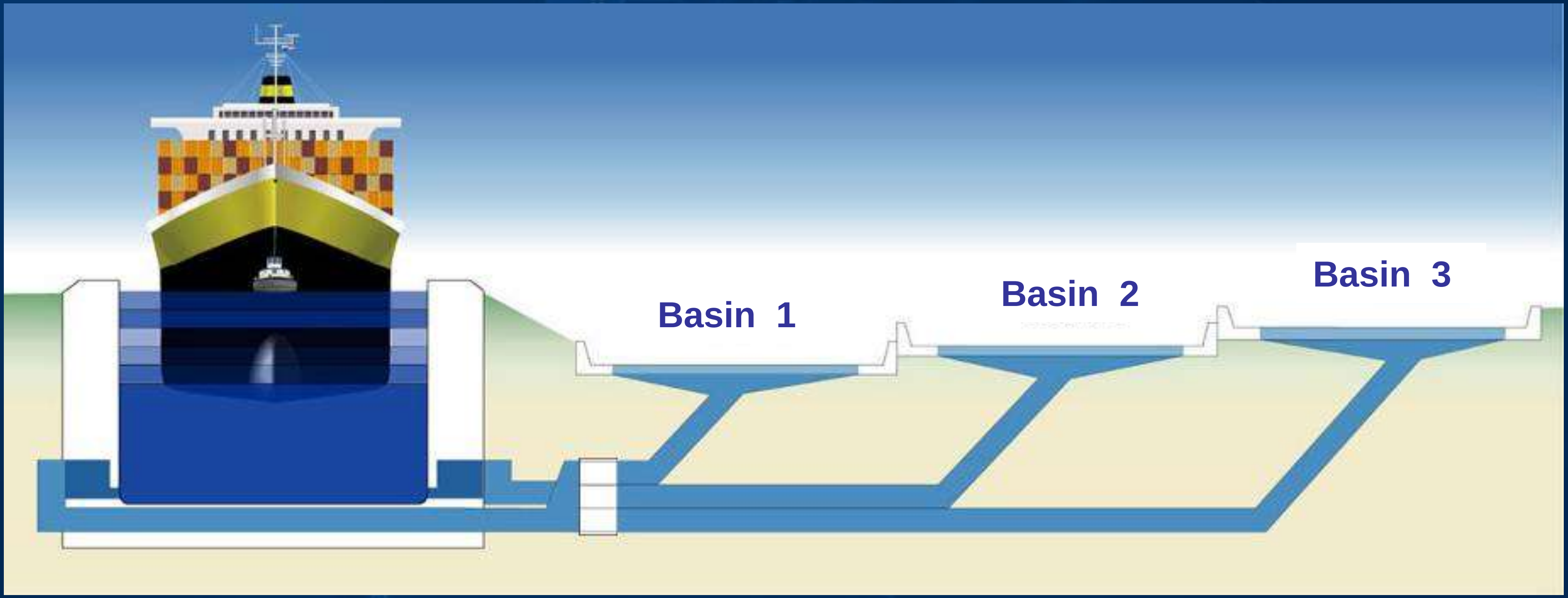
Length of lock chamber 427m (1,400')

Maximum Ship beam 49m (160')

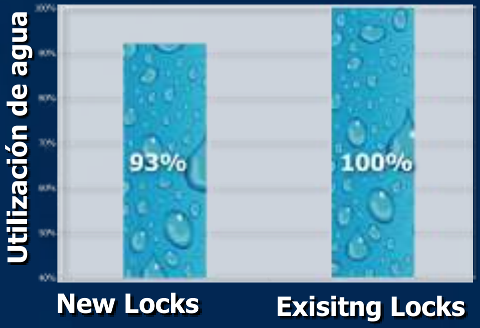
Maximum Ship length 385.8m (1,265')

Maximum ship draft 15.2 m (50')

Post-Panamax Water Saving Basins Locks Operation



With the reutilization water basins the new Locks will use <u>7% less</u> water than the existing Locks



Conclusion

Dry Bulk Vessels
Costs in $/MT – Grain Route – US Gulf to Asia
FY 2015

Vessel Size	Fuel	Charter Rates	Port	Canal	Cargo Handling	Inland Cost	Total Cost	Canal Cost Impact (%)	Economies of Scale ($/MT)	Savings from Economies of Scale Total
55,000 DWT	$ 12.42	$ 13.66	$ 2.91	$ 2.89	$ 8.17	$ 33.67	**$ 73.72**	**3.9%**		
95,000 DWT	$ 9.55	$ 9.67	$ 2.73	$ 2.33	$ 8.17	$ 33.67	**$ 66.13**	**3.5%**	**$ (7.59)**	**$ 649,322.80**

Assumptions for FY 2015:
Panama Canal tolls based on current tariff approved for FY 2014 (PC/UMS Pricing Structure)
Utilization Rate 90% unless stated otherwise
Current Fuel Prices as of November 2012 (HFO Singapore $605/MT)
Charter Rate forecasted to FY2015 (Drewry)

Vessel Size	Canal as a Percentage of Commodity Price (%)
55,000 DWT	**0.5%**
95,000 DWT	**0.4%**

*Soybeans represent 52% of the US Gulf grain trade to Asia via the Panama Canal.
* Soybean price = $607/MT according to the December 2012 data of The World Bank

Cost savings generated by economies of scale by vessel sizes:

- **95,000 DWT vs. 55,000 DWT: $7.59/MT**
  $649,322.8/Trip

Source: ACP/PCRCAM - 2012

Delivered Dry Bulk Fleet for Expanded Canal Only
Beam between 32.4 - 49 m

DWT Range	Number of Ships	Avg. DWT	Avg Beam (m)	Avg LOA (m)	Avg Draft (m)
40,000- 50,000	3	45,866	33.91	195.00	11.40
50,001- 60,000	22	55,121	35.81	200.31	11.51
60,001- 70,000	30	63,520	35.27	218.00	12.21
70,001- 80,000	55	76,205	34.00	230.00	13.49
80,001- 90,000	99	86,711	37.71	231.00	13.76
90,001- 100,000	176	93,396	39.32	233.75	14.26
100,001- 110,000	19	105,646	42.71	250.79	13.91
110,001- 120,000	27	115,656	43.00	253.00	14.55
120,001- 130,000	16	124,394	41.13	265.00	15.67
130,001- 140,000	12	136,069	42.67	268.24	16.85
140,001- 150,000	79	148,358	43.38	271.00	17.17
150,001- 160,000	80	152,494	44.00	274.87	17.28
160,001- 170,000	111	166,894	45.04	286.19	17.70
170,001- 180,000	499	175,575	45.12	290.00	18.01
180,001- 185,000	174	180,783	45.00	291.00	18.17
185,001- 190,000	19	186,545	47.00	292.19	18.04
190,001+	4	195,606	46.94	298.00	18.42
Total	1,425				
Total in Dry Bulk Fleet	5,373				

Source: Fairplay, Dic 2011

On Order Dry Bulk Fleet for Expanded Canal Only
Beam between 32.4- 49 m

DWT Range	Number of Ships	Avg. DWT	Avg Beam (m)	Avg LOA (m)	Avg Draft (m)
40,000- 50,000	0	0	0.00	0.00	0.00
50,001- 60,000	24	54,792	32.63	190.00	12.66
60,001- 70,000	15	63,227	36.78	211.44	11.95
70,001- 80,000	9	76,344	35.00	226.00	13.52
80,001- 90,000	22	85,605	35.97	228.00	13.98
90,001- 100,000	135	94,036	38.00	234.00	14.47
100,001- 110,000	8	106,588	43.00	251.00	14.00
110,001- 120,000	73	115,696	43.00	253.00	14.56
120,001- 130,000	1	120,950	43.00	249.34	15.25
130,001- 140,000	0	0	0.00	0.00	0.00
140,001- 150,000	0	0	0.00	0.00	0.00
150,001- 160,000	0	0	0.00	0.00	0.00
160,001- 170,000	2	170,000	45.00	287.00	17.70
170,001- 180,000	196	178,272	45.16	292.26	18.18
180,001- 185,000	64	180,598	45.00	291.00	18.12
185,001- 190,000	0	0	0.00	0.00	0.00
190,001+	0	0	0.00	0.00	0.00
Total	549				
Total in Dry Bulk Fleet	2,077				

Source: Fairplay, Dic 2011

Opportunities for increased cargo tonnage are expected from grain, coal and iron ore cargoes

Drybulk Cargo projections in million long tons				
Main commodities	2014	2015	Additional tonnage	Var%
Grains	39.3	44.5	5.2	13%
Coal	15.6	20.8	5.2	33%
Iron ore	5.5	11.5	6.0	109%
Other dry bulks	44.0	45.1	1.1	2%
Total	104.4	121.9	17.5	17%

Source: Nathan Associates Inc. study with CRU International Ltd. and IHS Inc.under contract for ACP, september 2012

Expanded Canal Benefits

⇨ Increased cargo carrying capacity with larger vessels and more draft capacity

⇨More efficiencies in logistics networks and costs for shippers

⇨ Opportunity for more flexibility to get advantage of demand surges. (China)

⇨ Improved times

Project Evaluation
New Opportunities

LNG Terminal

Ro-Ro Terminal

Ship Repair

Logistics Parks

Bunkering Terminal

Container Barging

Top-Off Operations

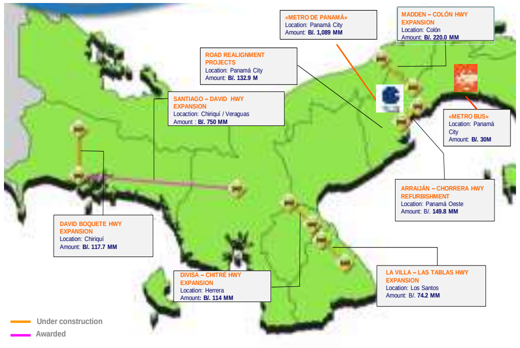
Corozal Container Terminal

Panama Developed, Ongoing and Projected Investment Projects

Expansion of the Panama Canal ($5.25 billion)

Highway System($2.7 B)

(as of February 2011)



Ports Expansion ($1.2 billion)

New container terminals ($600 million)

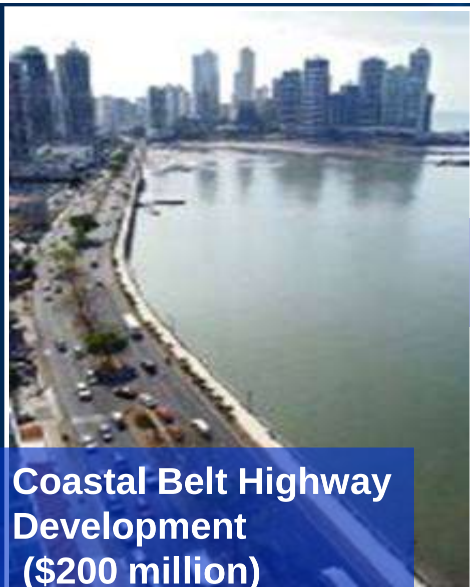
New Metro ($1.8 B million)

Intl Airport Expansion ($100 million)

Real Estate Development ($10 billion)

Hotel Development ($2,000 million)

Cleaning of the Panama Bay Project ($310 million)



Coastal Belt Highway Development ($200 million)

Cemex Expansion ($500 million)

Panama Pacific Special Economic Zone Agency ($600 million)

Visit: http://proinvex.mici.gob.pa

Thank you!

María Eugenia de Sánchez,
Senior Trade Specialist, Traffic Projections/Drybulk Segment
Office of Market Research and Analysis
Panama Canal Authority
Email: mesanchez@pancanal.com

For latest updates and videos, visit:
http://www.pancanal.com/eng/expansion/index.html
http://micanaldepanama.com/categoria/ampliacion-del-canal-de-panama/

Webcam:
http://micanaldepanama.com/ampliacion-del-canal-de-panama/camaras-web-de-ampliacion/