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Potential Impacts of Panama Canal Expansion on U.S. Cotton

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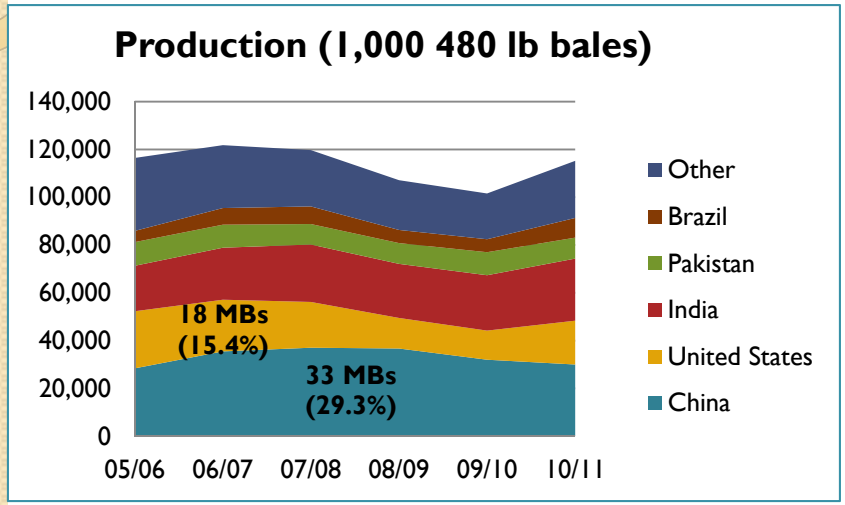
Overview

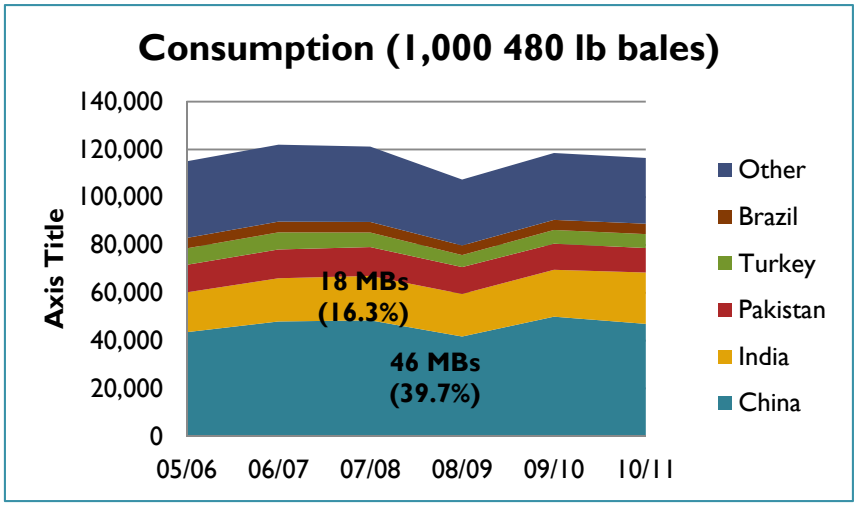
- Background
  - Based on AMS Project Results by R. Costa, P. Rosson, F. Adcock, F. Fraire, J. Robinson & S. Fuller
- Results
- Conclusions & Implications

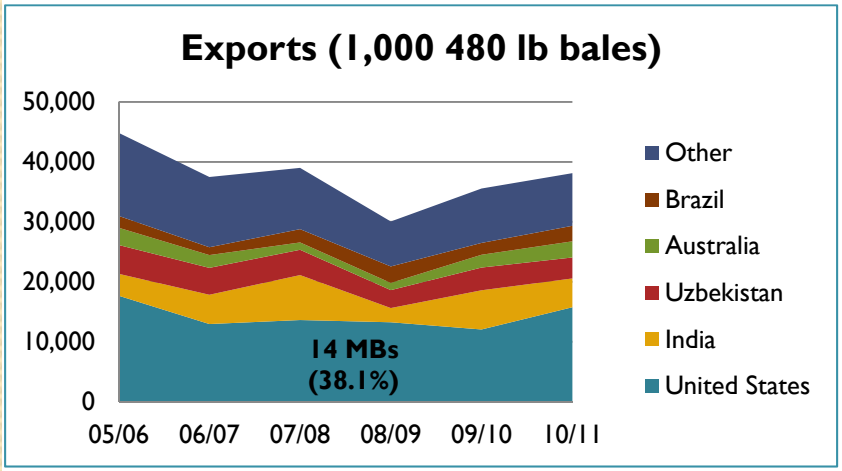
Background

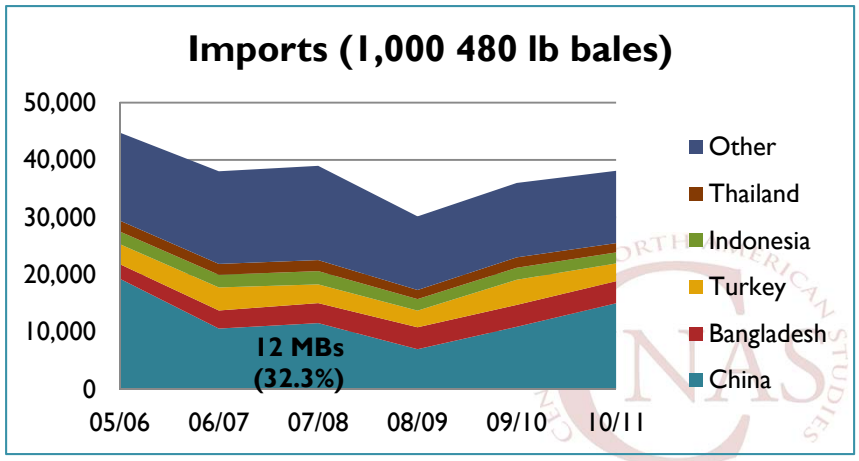
Global Cotton Distribution

The major players in the world are China and the U.S. , FAS, USDA







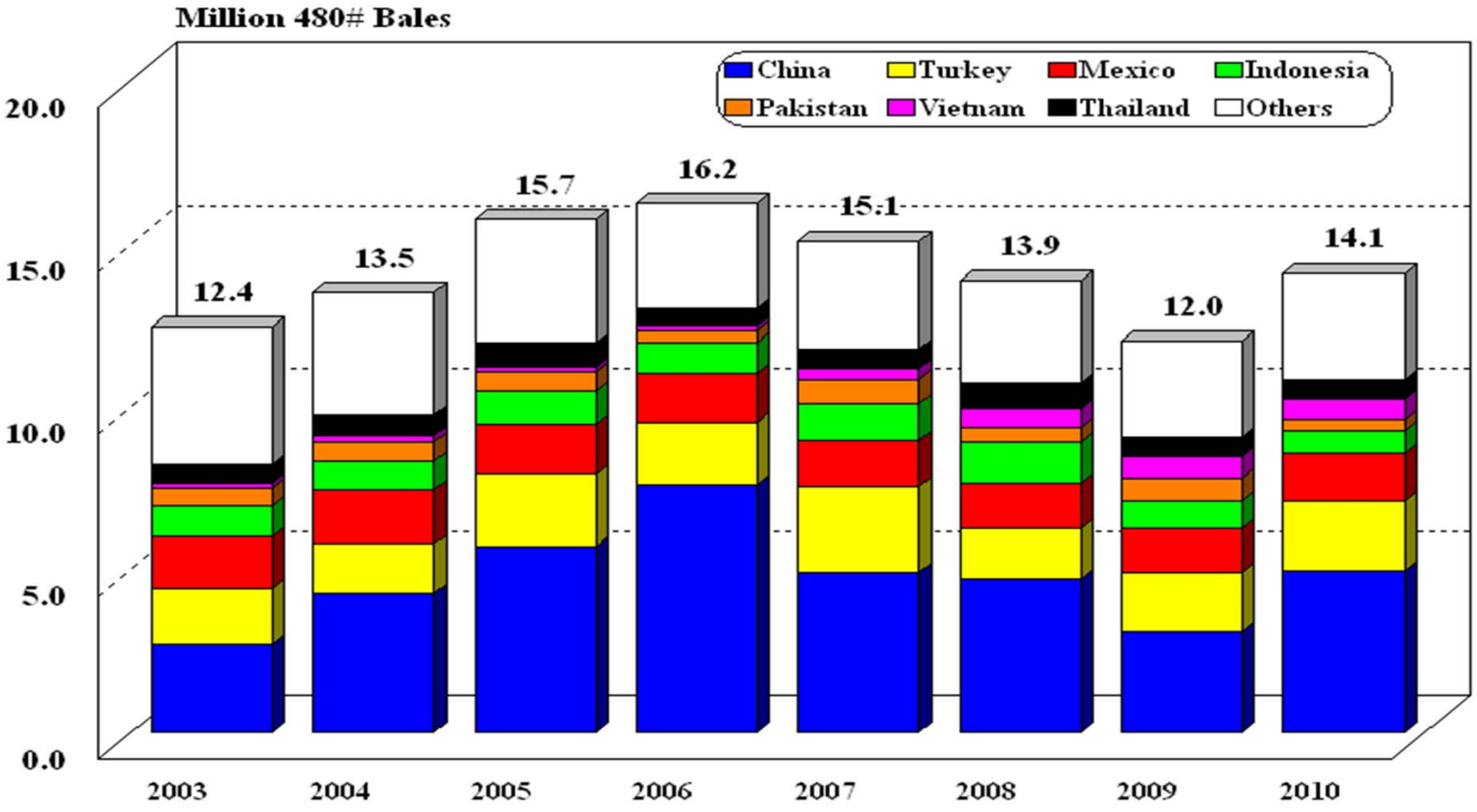


Background (cont.)

Major U.S. cotton export destinations

Historically, the top 3 destinations for U.S. cotton exports are China, Turkey, and Mexico

Figure 2. Volume of U.S. Cotton Exports by Market



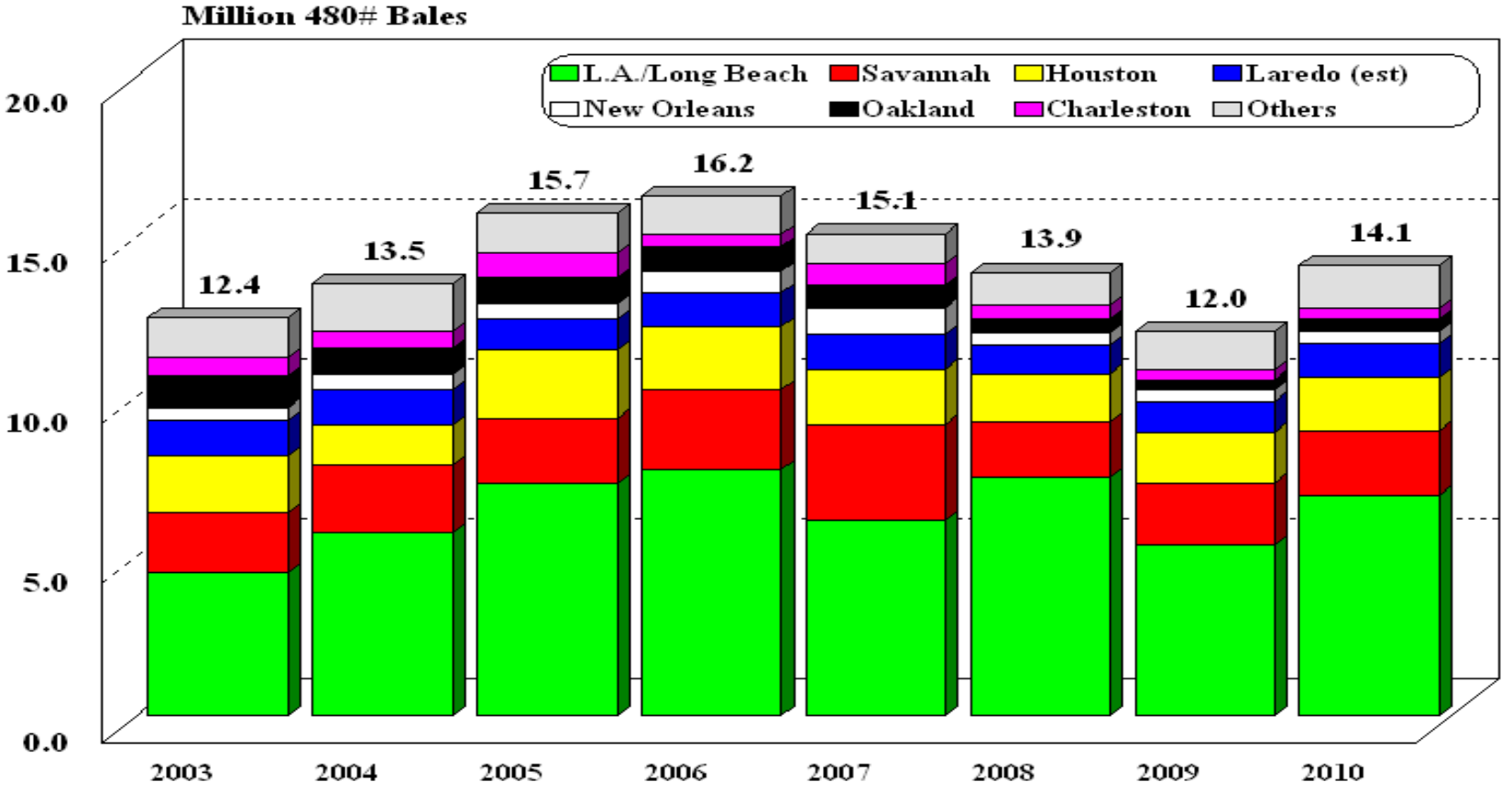
Source: Global Agricultural Trade System (GATS), USDA Foreign Agricultural Service, http://www.fas.usda.gov/gats/default.aspx

Background (cont.)

Major U.S. cotton export ports

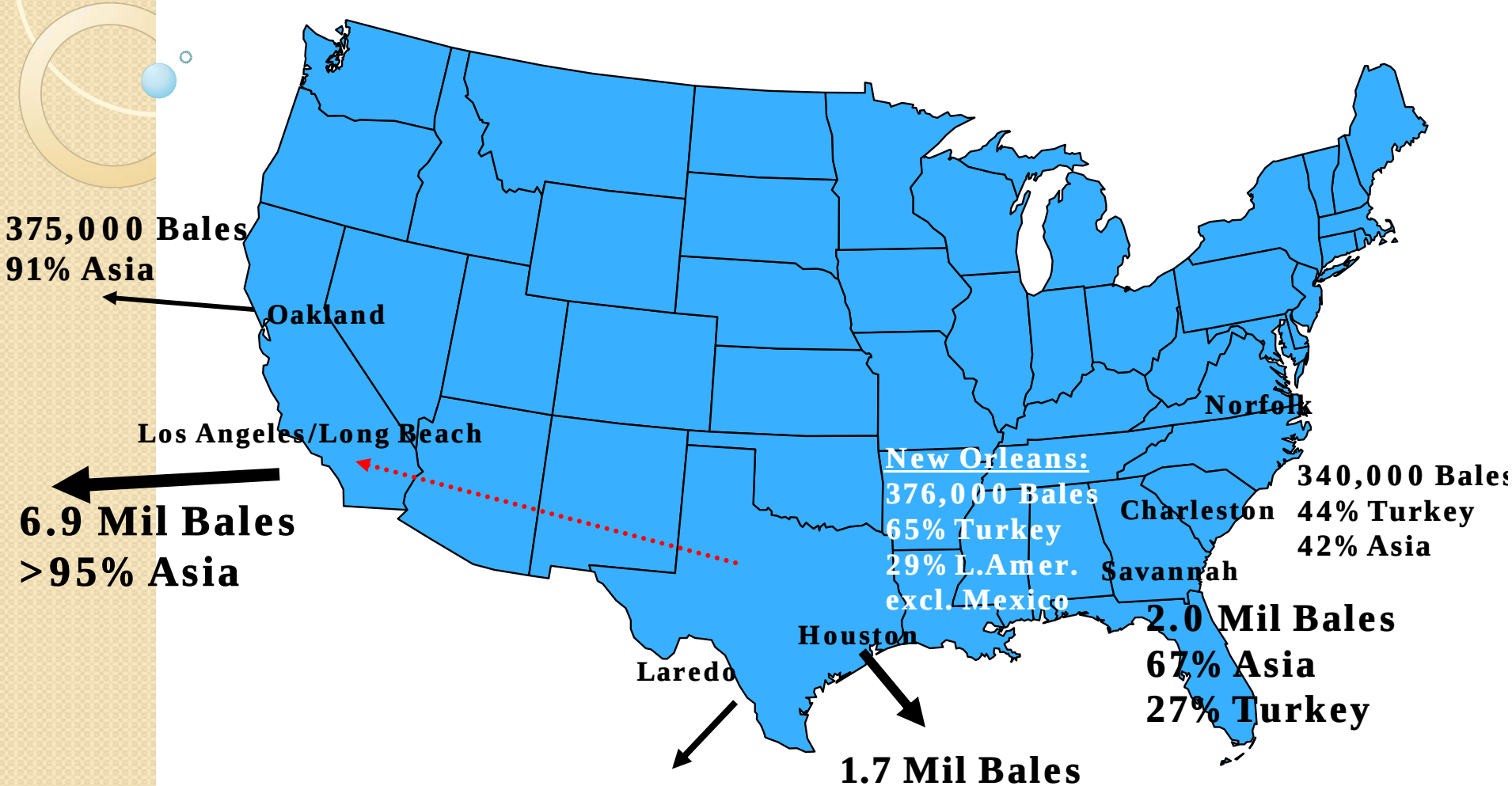
Historically, the top 3 U.S. cotton exporting ports are Long-Beach/Los Angeles ports, Savannah and Houston

Figure 3. U.S. Cotton Exports by Port



Source: Global Agricultural Trade System (GATS), USDA Foreign Agricultural Service, http://www.fas.usda.gov/gats/default.aspx

US Cotton Exports by Port & Destination, 2010



Source: WISERTrade

Background (cont.)

Panama Canal Importance to U.S. Cotton Exports

- In 2010, 1.34 million bales from Norfolk, Charleston, and Savannah exported to East Asia via Panama Canal (compiled from WISERTrade)
- This represents ~10% of the total U.S. exports
- Panama Canal cannot handle post-Panamax vessels (12,000 TEUs)
- U.S. cotton exports via the Panama Canal were via smaller Panamax vessels (<5,000 TEUs)

TEU: No. of Twenty-foot Equivalent Unit of Containers

Background (cont.)

Panama Canal Expansion (PCE) & Costs

- Economies of scale in maritime shipping
  - Currently, 36% of the world containerized fleet is Post-Panamax vessels (up to 12,000 TEU)
  - After PCE, shipping costs per container likely decline 40%
- Cost structure
  - Panamax vessel operational costs of $2,314/TEU (4,000 TEU)
  - Post-Panamax vessel operational costs of $1,449/TEU (10,000 TEU)

Background (cont.)

Panama Canal Expansion

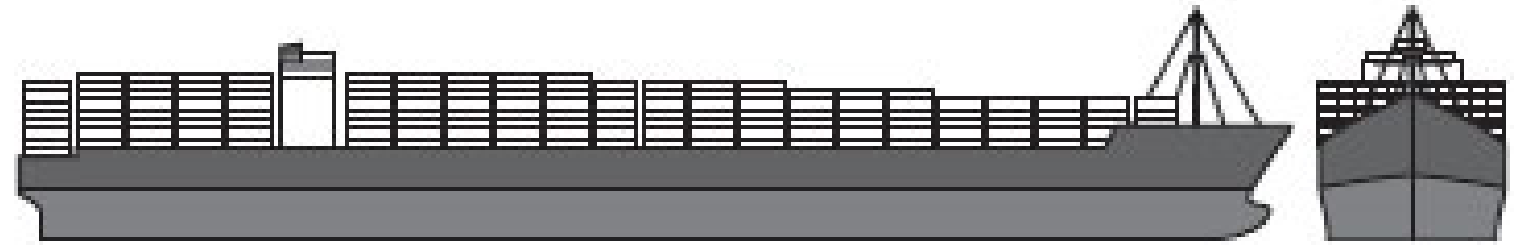
- Transit times vs. PCE Cost Savings
  - The East Coast to China (Shanghai port) route via the Panama Canal (all-water) is 7-8 transit days longer than the Intermodal Option (West Coast ports then rail to East Coast)
  - Intermodal Option across US is more efficient time-wise
  - But, the all-water route from the East Coast is about $490/TEU cheaper than the Intermodal Option
  - This cost differential corresponds to a savings of ~$70/TEU/day ($490/TEU/7 days)
  - PCE will reduce maritime costs at least $210/TEU for the East Coast ports to China

Background (cont.)

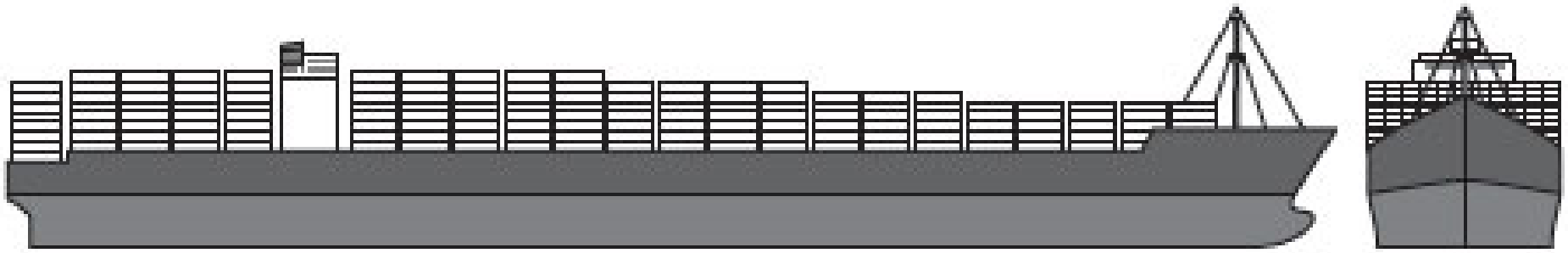
Panama Canal Expansion

- Panama Canal Expansion & Toll Charges
  - Recent toll increases captured 30% of the potential savings of the expansion or $70/TEU of $210/TEU
- PCE will reduce maritime costs for shipments from the Gulf & South Atlantic ports to China by $140/TEU

Panama Canal Expansion (PCE): $5.25 Billion Project Completed by 2014



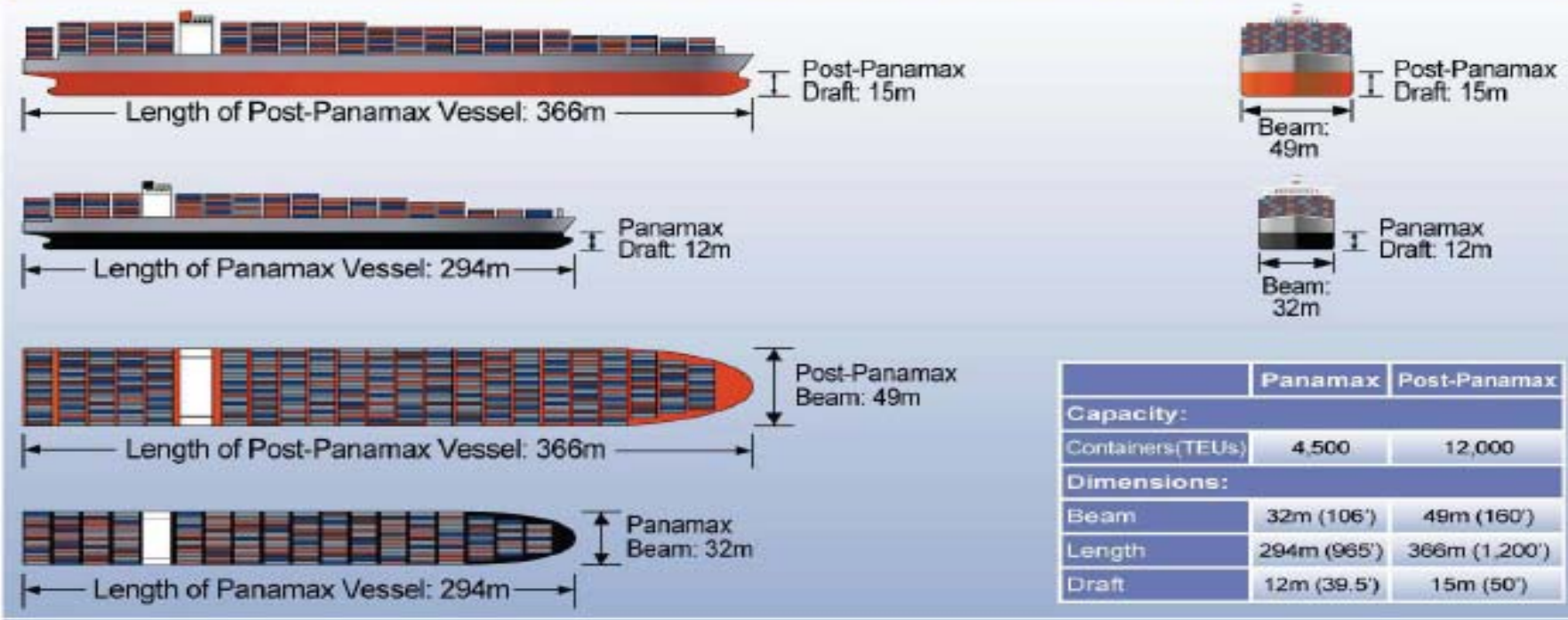
Panamax: max. load 5000 containers



Post-Panamax: max. load 12,000 containers

- PCE Will More than Double Average Vessel Size Passing thru the Canal by Adding a Third Shipping Lane
- Congestion Led to Expansion Project
- 97% of New Vessel Orders Are Post-Panamax Size

Comparison between Panamax and Post-Panamax Container Vessels



	Panamax	Post-Panamax
Capacity:		
Containers(TEUs)	4,500	12,000
Dimensions:		
Beam	32m (106')	49m (160')
Length	294m (965')	366m (1,200')
Draft	12m (39.5')	15m (50')

Source: ACP Report

Built	Name	Length	Beam	Maximum TEU	Max Draft	Deadweight Tons	US Ports Called at
2006	Emma Mærsk	1300'	180'	>11,000	51'	156,907	None
2005	Gudrun Mærsk	1200'	140'	10,150	48'	115,700	None
2006	Xin Los Angeles	1100'	150'	9,600	48'	112,488	None
2006	COSCO Guangzhou	1150'	140'	9,450	46'	107,000	None
2006	CMA CGM Medea	1150'	140'	9,415	48'	113,964	None
2003	Axel Mærsk	1156'	140'	9,310	44'	109,000	None
2006	NYK Vega	1100'	150'	9,200	48'	94,000	None
2005	MSC Pamela	1100'	150'	9,178	48'	107,849	None
2006	MSC Madeleine	1140'	140'	9,100	48'	108,637	Los Angeles
2006	Hannover Bridge	1100'	150'	9,040	47'	99,214	None

Source: Lloyd's Register, News Release (2006)

Current Operations
4,500 TEU – 5,000 TEU

Emma Maersk
15,000 TEU

What We Did & Why

- Assess Impacts of the Panama Canal Expansion on U.S. Cotton Exports by Port
- Evaluate PCE Impacts on U.S. Cotton Export Flows, Export Levels, Prices & Revenues
- PCE is Underway & Will Be Completed by Mid - 2014
- PCE Will Shape Future Competitive

Position of US Cotton Production & Exports

- Maximize (Whse Revenue) – (T Costs)

Scope of the Spatial Price Equilibrium Model

- 416 excess supply regions and 25 excess demand regions.
- 410 US excess supply regions (warehouses)
- 6 foreign regions (Australia, Brazil, India, Sub-Sahara Africa, Uzbekistan & other exporters)
- 11 US excess demand regions (domestic mills)
- 14 foreign excess demand regions (Bangladesh, China, EU-27, Hong Kong, Indonesia, Japan, Mexico, Pakistan, South Korea, Taiwan, Thailand, Turkey, Vietnam & other importers)
- US cotton transportation network connects excess supply regions with excess demand regions & ports via truck & rail
- 15 U.S. cotton exporting ports and 5 intermodal (rail loading) sites

Data and Parameters

- Estimated excess demand and supply equations; cotton handling and storage costs; and railroad, truck, ocean freight rates
- In the US model, excess supply regions are warehouses which are optimal solution to the least cost shipping model developed by Fraire et. al (2010)
- Truck and rail rates were based on estimates from Fraire et. al (2010)
- Ocean freight rate estimates were proxies of the difference between import price (CIF) and export price (FOB) for each pair of trading partners

Results

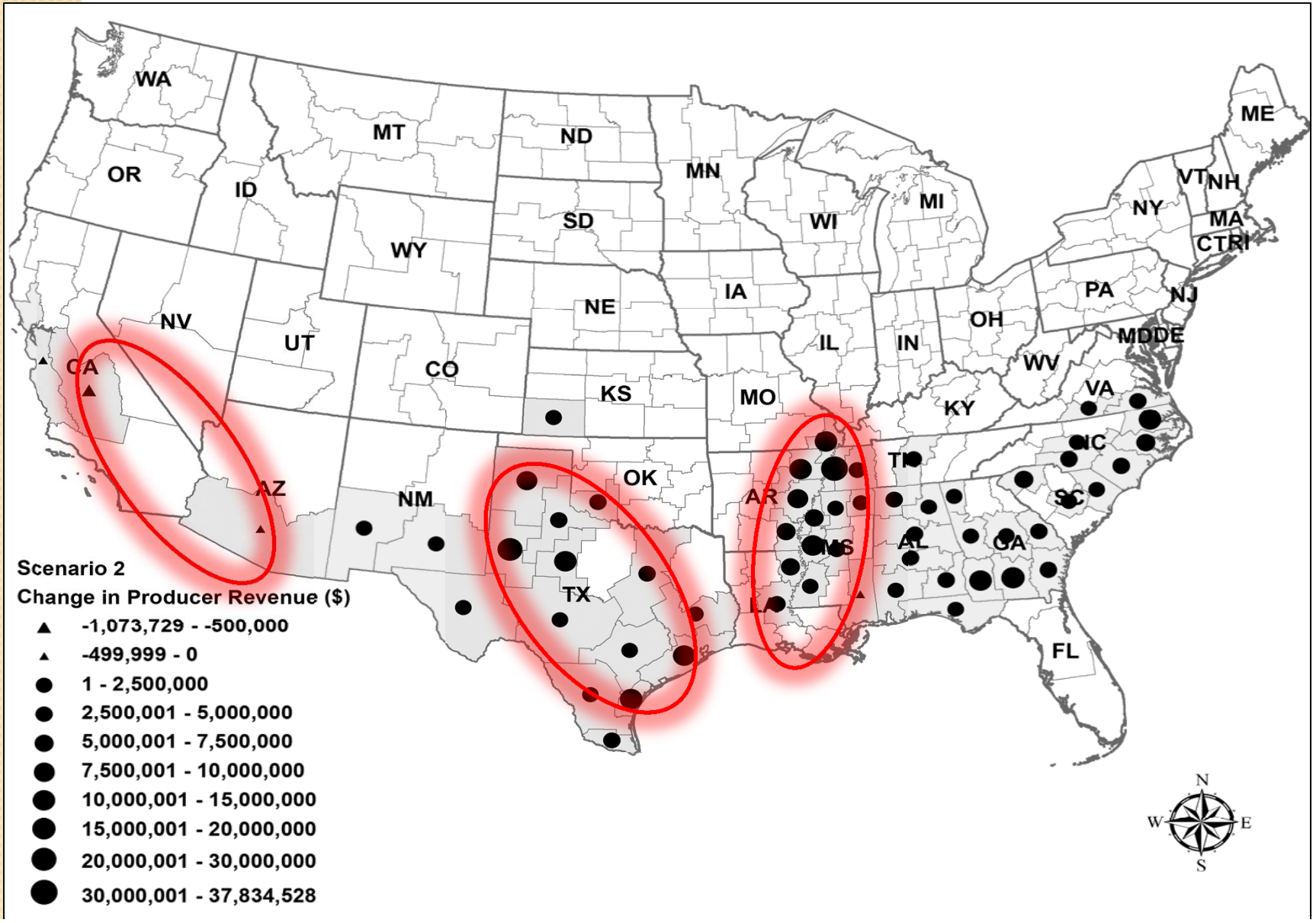
28% Reduction in Ocean Freight rates Due to PCE

- Panama Canal expansion is expected to increase cotton exports via the Panama Canal
- U.S. Gulf and Atlantic ports should increase exports
- Pacific Coast ports, however, would experience a reduction in exports

Model Validation & Results for 28% Reduction in Ocean Freight, Gulf & S. Atlantic Ports

Port		Validation		Results	
	Avg (2007-09)	Estimated Base Model	% Deviation from Base Model	Estimated	% Deviation from Base Model
LA - LB	6,289.1	6,163.3	-2.0	1,879.5	-69.5
Savannah	2,231.4	2,236.7	0.3	4,450.9	99.0
Houston	1,609.7	1,551.8	-3.6	2,434.5	56.9
Laredo - El Paso	989.3	1,141.3	15.4	1,269.5	11.2
New Orleans	529.5	514.7	-2.8	1,197.8	132.7
Oakland	480.6	343.8	-18.5	343.3	-0.1
Charleston	479.9	338.3	-29.5	875.6	158.8
Hidalgo - Bvl	373.7	340.6	-8.9	179.2	-47.7
Norfolk	273.1	282.2	3.3	617.9	118.9
Gulfport	107.0	45.3	-57.7	20.5	-54.9
Mobile	30.7	72.8	137.1	0.0	-100.0
Total	13,643.7	13,030.8	-4.5	13,268.8	1.8

Warehouse Revenue Change Attributed to 28% Reduction in Ocean Freight, Gulf & S. Atlantic Ports



Change in Warehouse Revenue & Value of Cotton Due to 28% Reduction in Ocean Freight, Gulf & S. Atlantic Ports

State	Revenue ($ Million)	Price ($/480 lb Bale)
Texas	$85.73	$11.42
Georgia	$44.46	$21.03
Tennessee	$42.31	$19.68
Arkansas	$30.04	$18.36
Mississippi	$21.78	$18.99
North Carolina	$23.84	$21.78
Missouri	$13.61	$17.32
South Carolina	$11.29	$22.60
Louisiana	$8.83	$18.82
Alabama	$8.79	$16.66
Virginia	$4.64	$21.89
Florida	$1.58	$20.69
New Mexico	$0.78	$16.26
Kansas	$0.14	$17.27
Oklahoma	$3.12	$11.78
Arizona	$(0.45)	$(1.00)
California	$(1.14)	$(0.94)
U.S. Total	$299.36	$16.04

Summary

Panama Canal Expansion Will Play Major Role in Future of US Cotton Exports

- Total U.S. cotton Exports Increase by 238,000 Bales, 2%
- Gulf and S. Atlantic Ports Increase Exports by 4.6 Million Bales or 90%
- West Coast Exports Decline by 4.3Million Bales or 66%

Summary

- Gains in Revenue for Most Cotton Producing States
  - TX, GA, TN & AR Lead Gainers
- CA & AZ Lose Revenue
- Total Revenue Increase, $300 Million
  - $86 Million Gain for Texas

Conclusions

- PCE Could Be Larger than Estimated
- Texas Gains Regardless
- Competitive Position of US Cotton Enhanced
- Gulf & South Atlantic Ports Stand to Gain
  - ➢ Constraints: Depth, Land Area & Funding
- Infrastructure Improvement & Gains Follow Port Development
  - ✓ Roads, Bridges, Power Supplies, etc.

Implications & Further Research

- ✓ Analysis of Larger Reductions in Ocean Freight Rates
- ✓ Analyze Impacts on Competing Exporters (Brazil is Underway)
- ✓ Evaluate Prices and Revenue at US Mills

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Questions?

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