Grain Transportation Issues: Katrina and Beyond

• Review the importance of Mississippi River water transportation to American agriculture and the US economy generally.
• Discuss specific impacts of Hurricanes Katrina and Rita on grain exports and upbound movements of agricultural inputs.
• Discuss the changes in transportation and other trends that impact the ultimate utilization and disposition of Minnesota's crops.
• Discuss the transportation issues that will face rural Minnesota after this year's difficulties are past.
The Mississippi River Watershed and It’s Major Navigable Waterways

15 barge tows on locked rivers
30-40 on open water below St Louis
Mississippi River Freight Profile

- Mississippi River: 715 million tons total
- Mississippi River (Domestic): 496 million tons
- Upper Miss: 84 million tons total
- St Louis: 33 million tons total
- Ohio River: 282 million tons total
- Imports: 88 million tons total
- Exports: 100 million tons total

- Mississippi River from Baton Rouge to the Gulf handles the most tonnage in the world
## MISSISSIPPI RIVER FREIGHT COMMODITY PROFILE

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Domestic</th>
<th>Imports and Exports</th>
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<tbody>
<tr>
<td>Coal</td>
<td>188.4</td>
<td>177.1</td>
<td>11.3</td>
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<tr>
<td>Raw Materials</td>
<td>115.7</td>
<td>99.0</td>
<td>16.7</td>
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<tr>
<td>Food &amp; Farm Prod</td>
<td>171.1</td>
<td>83.5</td>
<td>87.6</td>
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<tr>
<td>Petro &amp; Prod</td>
<td>150.6</td>
<td>75.3</td>
<td>75.3</td>
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<tr>
<td>Chemicals &amp; Prod</td>
<td>49.9</td>
<td>34.4</td>
<td>15.5</td>
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<tr>
<td>Manufactures</td>
<td>37.0</td>
<td>25.5</td>
<td>11.5</td>
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<tr>
<td>Equipment</td>
<td>1.8</td>
<td>1.2</td>
<td>0.6</td>
</tr>
<tr>
<td>Other</td>
<td>0.3</td>
<td>0.3</td>
<td>0.0</td>
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<tr>
<td>Total</td>
<td>714.8</td>
<td>496.3</td>
<td>218.5</td>
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## Distances to Competing World Export Grain Ports

<table>
<thead>
<tr>
<th>Country</th>
<th>Distances</th>
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<tbody>
<tr>
<td>Argentina</td>
<td>40 to 400 miles</td>
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<tr>
<td>European Community</td>
<td>20 to 300 miles</td>
</tr>
<tr>
<td>Australia</td>
<td>80 to 300 miles</td>
</tr>
<tr>
<td>South Africa</td>
<td>120 to 450 miles</td>
</tr>
<tr>
<td>Southern Brazil</td>
<td>50 to 600 miles</td>
</tr>
<tr>
<td>Northwest Brazil</td>
<td>1000 miles to Amazon River.</td>
</tr>
<tr>
<td>Canada</td>
<td>200 to 2400 miles</td>
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</table>
Distances from Midwest Grain Shipping Areas to Ocean Ports (in miles)

<table>
<thead>
<tr>
<th></th>
<th>NEW ORLEANS</th>
<th>EAST COAST</th>
<th>WEST COAST</th>
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<tr>
<td></td>
<td>Rail</td>
<td>Barge</td>
<td>Truck</td>
</tr>
<tr>
<td>MPS/SP</td>
<td>1273</td>
<td>1670</td>
<td>1346</td>
</tr>
<tr>
<td>ST LOUIS</td>
<td>699</td>
<td>1010</td>
<td>698</td>
</tr>
<tr>
<td>PEORIA</td>
<td>864</td>
<td>1299</td>
<td>862</td>
</tr>
<tr>
<td>CINCINNATI</td>
<td>836</td>
<td>1303</td>
<td>802</td>
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</table>
Comparative rates in $ per ton from Midwest Grain Areas to Mississippi River Ports

<table>
<thead>
<tr>
<th>Barge</th>
<th>percent of tariff</th>
<th>Rail</th>
<th>$ per ton-mile</th>
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<tr>
<td></td>
<td>135%</td>
<td>$.012</td>
<td></td>
</tr>
<tr>
<td></td>
<td>175%</td>
<td>$.017</td>
<td></td>
</tr>
<tr>
<td></td>
<td>250%</td>
<td>$.022</td>
<td></td>
</tr>
<tr>
<td>Mpls/</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>St Paul</td>
<td>8.36</td>
<td>15.28</td>
<td>21.60</td>
</tr>
<tr>
<td></td>
<td>10.83</td>
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<td>28.01</td>
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<td></td>
<td>15.48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>St</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Louis</td>
<td>5.39</td>
<td>8.38</td>
<td>11.88</td>
</tr>
<tr>
<td></td>
<td>6.98</td>
<td></td>
<td>15.38</td>
</tr>
<tr>
<td></td>
<td>9.98</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peoria</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.49</td>
<td>10.37</td>
<td>14.69</td>
</tr>
<tr>
<td></td>
<td>8.41</td>
<td></td>
<td>19.01</td>
</tr>
<tr>
<td></td>
<td>12.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cincin-nati</td>
<td>6.33</td>
<td>10.03</td>
<td>14.21</td>
</tr>
<tr>
<td></td>
<td>8.21</td>
<td></td>
<td>18.39</td>
</tr>
<tr>
<td></td>
<td>11.73</td>
<td></td>
<td></td>
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</tbody>
</table>

Katrina
Katrina Impacts on US Agricultural Industries

• Lost 3-4 weeks of Grain Shipments from Gulf Elevators Just before Harvest
• Damage and Disruption to Barge industry
• Disrupted all major Railroads in South from Florida to Texas
• Impact on Fuel Supplies
• Impacts on Fertilizer production and imports
• Reduced backhauls because of high downbound rates
• Impacts on supplies and movements of imported steel, cement etc
Short Run Impact on Grain Exports

- Mississippi River Elevators closed Friday before Katrina and evacuated employees
- Export elevators were not badly damaged
- There was difficulty restarting shipments because workers are scattered and without living quarters in some areas
- Shortage of diesel fuel for backup generators
- Export shipments on deep draft vessels restarted after 2-3 weeks
- Barge shortage continued for weeks because of damage, disruption and upstream backlogs (4000 at one time)
- USDA is paid to get 145 barges unloaded and back in circulation and is contracting for about 175 more
What Happened to Grain Markets After Katrina

Enormous Basis Drop Throughout Region
CHANGE IN CORN BASIS
FRI AUG 28 to WED SEPT 7

As the effects of slowed Gulf Coast exports spread, a lower basis moved inland from rivers.
3 YEAR BASIS COMPARISONS OCT 27 2005
So What Happened to Grain Markets After Katrina

• Enormous Basis Drop
• Sky High Barge Rates
SOUTHBOUND BARGE RATES MID MISSISSIPPI TO GULF

PERCENT OF TARIFF

WEEK OF


2005  2004

Katrina 16
## Spot Southbound Barge Rates

### Twin Cities to Gulf

<table>
<thead>
<tr>
<th>DATE</th>
<th>2004</th>
<th></th>
<th>2005</th>
<th></th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>PERCENT</td>
<td>RATE</td>
<td>PERCENT</td>
<td>RATE</td>
<td>PERCENT</td>
<td>RATE</td>
</tr>
<tr>
<td></td>
<td>of TARIFF</td>
<td>TON</td>
<td>BUSHEL</td>
<td>of TARIFF</td>
<td>TON</td>
<td>BUSHEL</td>
</tr>
<tr>
<td>Mid July</td>
<td>177</td>
<td>$10.96</td>
<td>$0.31</td>
<td>410</td>
<td>$25.38</td>
<td>$0.71</td>
</tr>
<tr>
<td>Mid August</td>
<td>235</td>
<td>$14.55</td>
<td>$0.41</td>
<td>385</td>
<td>$23.83</td>
<td>$0.67</td>
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<tr>
<td>Mid Sept</td>
<td>314</td>
<td>$19.44</td>
<td>$0.54</td>
<td>550</td>
<td>$34.05</td>
<td>$0.95</td>
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<tr>
<td>Mid Oct</td>
<td>335</td>
<td>$20.74</td>
<td>$0.58</td>
<td>673</td>
<td>$41.66</td>
<td>$1.17</td>
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<tr>
<td>Early Nov</td>
<td>374</td>
<td>$23.15</td>
<td>$0.65</td>
<td>519</td>
<td>$32.126</td>
<td>$0.90</td>
</tr>
</tbody>
</table>
Figure 1. Weekly Grain Barge Deliveries

Katrina 2005
So What Happened to Grain Markets After Katrina

• Enormous Basis Drop
• Sky High Barge Rates
• Sky High Rail and Truck Rates
Secondary Rail Car Market

$360 =$.10 a bushel

Source: Transportation & Marketing Programs/AMS/USDA

*up to 6 months of trading
Midwest Diesel Fuel Price 2004 and 2005

Price Per Gallon

Week of

- 2005
- 2004
So What Happened to Grain Markets After Katrina

- Enormous Basis Drop
- Sky High Barge Rates
- Sky High Rail and Truck Rates

**Result**

- Grain Shipments are backed up throughout the region and grain is piled on the ground
• Was this all caused by Katrina (and Rita)??
What about next year??
• 2005 Crop size was underestimated
• Large 2004 crop had not been moved and much was still in storage (farmers and elevators holding)
• North American railroad system has had capacity problems for 2 years - UP was close to meltdown in early 2004
• Aging barge fleet, low water, and lock issues
• Next year’s carryover is projected to be even larger
Changes and Trends Impacting Minnesota Agriculture’s Markets and Grain Logistics

• Changing International Markets
• Freedom to Farm Adjustments
• Transportation Deregulation Impacts
• Biomass for Energy
• Genetically Enhanced Crops
Changing International Markets

• Demand shifts
  from USSR and EU to Pacific Rim and NAFTA countries
• Supply Shifts
  -- South America
  -- EU and Eastern Europe
  -- NAFTA

Product Shifts
  More Meat
  More Specialties and Perishables
ADJUSTMENTS

• Reduced corn and wheat through Duluth (and Thunder Bay)
• Rail to Seattle-Portland (Shuttle Trains)
• Rail to Mexico (Unit Trains from SW Minnesota and NW Iowa)
• Mississippi River and Panama Canal Route Remains Dominant
• Need for Refrigerated Container and IP Logistics Channels
Freedom to Farm Impacts

- Increase in soybean acres in valley
- Decrease in wheat
- Decrease in soybeans in SE United States
- Probably a substitution of high value and specialty crops for commodity crop program acres
ADJUSTMENTS

• Soybeans are now shipped through Duluth
• More Local Marketing of Specialty Crops??
• Rail to Mexico (Unit Trains from SW Minnesota and NW Iowa)-Cross border shipments now greater than all East Coasd exports
Transportation Deregulation Impacts 1

• Excess Capacity Eliminated (Rail About 1996)
• Rail Employment and Labor Costs Reduced
• Rail Mergers and Abandonments Allowed
• Shortline Railroad Industry Develops
• Decrease in Real Transportation rates from 1980-2000 (but increases likely in the future)
Transportation Deregulation Impacts 2

- Rail Contract Rates Legalized
- Unit-trains rules accepted
- Auction Market for Rail Cars (BNSF Cots)
- Negotiated Rail (and Truck) Rates and Services become widespread
- Railroad Rate/Service discrimination allowed
Transportation Deregulation Impacts 3

- Non Ag Trucks Deregulated – Major Efficiencies available in routing and backhauls
- Increased Truck Weight Limits
- Grain Car Sizes Increased
- Growth in Intermodal Containers
Biomass for Energy

- Ethanol from grain
- Ethanol from Cellulose
- Biodiesel from oil crops
- Biodiesel from yellow fats
- Biodiesel from waste
- Direct burning or Gasification of crop residues
Biomass for Energy Impacts 1

- Ethanol plants improve local basis
- Reduce need for long movements to ports (but may increase local road costs)
- USDA study says trucks move now more grain to markets than rail
- Have to market DDGS
- Soy diesel has fewer transportation impacts because of relationship with soy meal
Biomass for Energy Impacts 2

• Costs of collection, storage and processing of crop residues for burning, gasification, or conversion to ethanol seem to be **consistently underestimated** by biomass advocates
• Value for soil fertility and erosion control
• Narrow time window to collect or harvest
• Cost of harvesting, hauling, and storage
• Technology is still in R & D stage
• Proponents tend to ignore yield variability (both over and under)
Transportation Impacts of Genetically Enhanced Crops

• Require separate logistics channels for identity preservation
• Intermodal Containers
Future Agricultural Transportation Issues

- Railroad Capacity
- Access to Rail and Rail Services
- Upper Miss River Infrastructure Issues
- Missouri River Flows
- Intermodal Access, Capacity, and Equipment
- Intermodal Port Capacity and Productivity
- Jones Act Reform
- Identity Preserved Logistics Channels
Grain Transportation Issues
Katrina and Beyond

Thank You
Questions ??

Jerry Fruin

316 Classroom Office Building
fruin001@umn.edu
612 625 8720
The Missouri River navigation channel extends for 734.8 miles from near South Sioux City, Iowa to the mouth near St. Louis.
Environmental Comparisons

<table>
<thead>
<tr>
<th>Mode</th>
<th>Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Truck</td>
<td>59</td>
</tr>
<tr>
<td>Rail</td>
<td>202</td>
</tr>
<tr>
<td>Inland Barge</td>
<td>514</td>
</tr>
</tbody>
</table>

Relative energy efficiencies comparison:
- Truck: 59 miles
- Rail: 202 miles
- Inland Barge: 514 miles

Number of miles one ton can be carried per gallon of fuel:

100 200 300 400 500 600
Destinations of MN Corn in 1999

- Fed in MN: 37%
- MN Processors: 21%
- Pacific Northwest: 15%
- Mississippi & Gulf: 14%
- Duluth-Superior: 9%
- Other: 4%

Katrina 43
Destinations of MN Soybeans in 1999

1999 Disposition of Minnesota Soybeans

- Fed as Meal in MN: 28%
- Oil Extracted in MN: 11%
- Duluth-Superior: 11%
- Mississippi & Gulf: 6%
- Pacific Northwest: 16%
- Mexico: 23%
- Other: 5%

Fed as Meal in MN
Oil Extracted in MN
Duluth-Superior
Mississippi & Gulf
Pacific Northwest
Mexico
Other
MN Grain Destinations 7/99-6/00

GRAPH 1
MINNESOTA ESTIMATED ALLGRAIN DESTINATIONS 7/99-6/00
BUSHELS
History of Dispositions MN Soy Crops 1985-1999

Dispositions of 1999 and 1985 Minnesota Soybean Crops

- Total
- Other
- Mexico
- Pacific Northwest
- Mississippi & Gulf
- Duluth-Superior
- Oil Extracted in MN
- Fed as Meal in MN

Millions of Bushels

- 1999
- 1985
MN Elevators With 50 Rail Cars or Greater Capacity

Elevators w/ >50 Rail Car Cap
MN Railroads

Nov. 1999, Univ of Minn Dept. of Applied Economics & Center for Transportation Studies
1999 Grain & Oilseeds Avail. to Leave County (T/Sq. Mile)

Gravsqm.shp
- 0 - 300
- 300 - 600
- 600 - 900
- 900 - 1200
- 1200 - 1572
Status of Transportation Recovery
updated as of Tuesday, November 15, 2005
Roads and Highways
updated as of Tuesday, November 15, 2005

STATUS OF TRANSPORTATION-RELATED RECOVERY EFFORTS
Airports
updated as of Tuesday, November 15, 2005