What Happened While It Was Down?
The Colombia-Snake River Extended Lock Outage
Ken Casavant and Sara Simmons
WHAT HAPPENED WHILE IT WAS DOWN?
THE COLUMBIA-SNAKE RIVER EXTENDED LOCK OUTAGE

PRESENTATION TO THE WASHINGTON STATE TRANSPORTATION COMMISSION
KEN CASAVANT AND SARA SIMMONS
Transportation Disruption Study

- **Purpose**
  - Evaluate the economic and environmental impacts
  - Determine
    - Historical use of the river system
    - Preparations of industry and government entities
    - Impacts of the outage
    - Return of traffic to the river system
  - Produce a guide for other planned disruptions
Columbia-Snake River River Inland Waterways

Planned outage to rehabilitate an aging infrastructure

Replaced downstream gates for three locks

15 weeks
Annual Downbound and Upbound Tonnage of All Commodities, 1991-2010

Source: U.S. Army Corps of Engineers Monthly Lock Tonnage Reports
Major Commodities Moving on the Columbia-Snake River System

**Downriver**
- Wheat
- Forest products
- Sand, gravel and stone
- Rye, barley, rice, sorghum and oats
- Vegetable products
- Paper and allied products

**Upriver**
- Gasoline
- Distillate fuels (diesel)
- Garbage
- Fertilizer
- Smelted products
Seasonality in Major Downriver Commodities, 2008 – 2010

- 75% of all downriver shipments
- Harvest in August
  - High volume shipments through the winter
- March is a low volume month
  - Routine 2 week outages
Phase II

Objectives
- To describe the major waterborne movements prior to the extended lock outage
- To learn how the actors prepared

Data Sources
- U.S. Army Corps of Engineers’ Waterborne Commerce Statistics Center
- Shippers, government divisions, industry personnel and ports
Above Average Downriver Movements, Jul – Dec 2010

- Above average months: August – November
- December 2010: shipped almost as much as an average December
- Early shipments to preposition and fill early orders
Pacific Northwest Wheat Case Study

- **Background**
  - Wheat is the largest volume commodity that moves on the Columbia-Snake River

- **Purpose**
  - To capture the options and decisions of the wheat industry
  - To provide a baseline scenario for wheat transportation
## Pacific Northwest Wheat Case Study

<table>
<thead>
<tr>
<th>Region</th>
<th>Number of Firms</th>
<th>Annual Tonnage Shipped in Bushels</th>
<th>Percentage of Total Tonnage Shipped</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Oregon</td>
<td>5</td>
<td>32,800,000</td>
<td>12.68%</td>
</tr>
<tr>
<td>Northern Idaho</td>
<td>5</td>
<td>40,600,000</td>
<td>15.69%</td>
</tr>
<tr>
<td>Southern Idaho</td>
<td>3</td>
<td>7,500,000</td>
<td>2.90%</td>
</tr>
<tr>
<td>Northern Washington</td>
<td>5</td>
<td>87,900,000</td>
<td>33.98%</td>
</tr>
<tr>
<td>Southern Washington</td>
<td>8</td>
<td>89,912,000</td>
<td>34.75%</td>
</tr>
<tr>
<td>Pacific Northwest</td>
<td>26</td>
<td>258,712,000</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
Industrial Preparations

Barge Line Preparations
- Implementation of a “business interruption surcharge”
- Prepared customers and employees
  - Continued benefits
  - Layoffs for outage

Rail Line Preparations
- Prepared for an increase in cargo loads
- Advertised, identified inland markets and partnered with local ports to aid in the movement of products
Industry Impacts of the Lock Outage

- **Phase III**
  - **Objectives**
    - To learn how the actors were impacted
    - To describe the major commodity movements by rail and truck during the lock outage
  - **Data Sources**
    - Shippers, government divisions, industry personnel and ports
    - U.S. Army Corps of Engineers’ Waterborne Commerce Statistics Center
Data Sources

Industry representatives

Most notable finding: most products were transported by truck or a combination of truck and rail

Most industries planned to only use rail
- Inexpensive and can transport large volumes
- Due to the convenience of truck
- Industries chose to send their goods to alternative markets
- Short distances and small loads
### Rail and Truck Movements, December 2010 - March 2011 (Lock Outage)

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Mode</th>
<th>Tonnage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gasoline</td>
<td>Truck and Rail</td>
<td>184,192</td>
</tr>
<tr>
<td>Distillate Fuels</td>
<td>Truck and Rail</td>
<td>276,287</td>
</tr>
<tr>
<td>Fertilizers</td>
<td>Rail</td>
<td>1,500</td>
</tr>
<tr>
<td>Forest Products</td>
<td>Truck and Rail</td>
<td>58,283</td>
</tr>
<tr>
<td>Sand, Gravel and Stone</td>
<td>---</td>
<td>0</td>
</tr>
<tr>
<td>Iron Ore and Steel Waste</td>
<td>Rail</td>
<td>9,000</td>
</tr>
<tr>
<td>Smelted Products</td>
<td>---</td>
<td>-</td>
</tr>
<tr>
<td>Wheat</td>
<td>Truck and Rail</td>
<td>45,648</td>
</tr>
<tr>
<td>Corn, Rye, Barley, Rice and Oats</td>
<td>Truck</td>
<td>212</td>
</tr>
<tr>
<td>Agricultural Products</td>
<td>Truck and Rail</td>
<td>31,194</td>
</tr>
<tr>
<td>Waste Materials</td>
<td>Truck</td>
<td>68,250</td>
</tr>
</tbody>
</table>
A portion of the river worked: from the pool west of The Dalles to Portland (Bonneville Lock and Dam)

Downriver:
- A total of 377,000 tons were shipped downriver
  - 79% below average
- 4 major commodities
  - Wheat; forest products; sand, gravel and stone; and smelted products

Manufactured equipment and machinery traveled upriver
- Gate leaves constructed for The Dalles Lock and Dam
## Bushels of Wheat Shipped by Survey Respondents, Dec 2010 – Mar 2011

<table>
<thead>
<tr>
<th>Region</th>
<th>Total Bushels Shipped</th>
<th>Typical Percentage of Bushels Shipped</th>
<th>Actual Percentage of Bushels Shipped</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Oregon</td>
<td>9,680,000</td>
<td>12%</td>
<td>27%</td>
</tr>
<tr>
<td>Northern Idaho</td>
<td>2,430,000</td>
<td>16%</td>
<td>7%</td>
</tr>
<tr>
<td>Southern Idaho</td>
<td>1,620,000</td>
<td>3%</td>
<td>5%</td>
</tr>
<tr>
<td>No. Washington</td>
<td>20,320,000</td>
<td>34%</td>
<td>57%</td>
</tr>
<tr>
<td>So. Washington</td>
<td>1,430,000</td>
<td>35%</td>
<td>4%</td>
</tr>
<tr>
<td>Pacific Northwest</td>
<td>35,480,000</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>
Percentage of Wheat Shipped via Various Modes, Dec 2010 – Mar 2011
# Percentage of Wheat Shipped Via Various Transportation Modes

## December - March

<table>
<thead>
<tr>
<th>Region</th>
<th>Average Truck</th>
<th>Outage Truck</th>
<th>Average Barge</th>
<th>Outage Barge</th>
<th>Average Rail</th>
<th>Outage Rail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Oregon</td>
<td>1.0%</td>
<td>40.4%</td>
<td>91.8%</td>
<td>20.0%</td>
<td>7.2%</td>
<td>39.6%</td>
</tr>
<tr>
<td>Northern Idaho</td>
<td>0.3%</td>
<td>2.0%</td>
<td>78.9%</td>
<td>0.0%</td>
<td>20.8%</td>
<td>98.0%</td>
</tr>
<tr>
<td>Southern Idaho</td>
<td>33.3%</td>
<td>6.0%</td>
<td>21.7%</td>
<td>0.0%</td>
<td>45.0%</td>
<td>94.0%</td>
</tr>
<tr>
<td>No. Washington</td>
<td>14.0%</td>
<td>14.1%</td>
<td>14.6%</td>
<td>0.0%</td>
<td>71.4%</td>
<td>85.9%</td>
</tr>
<tr>
<td>So. Washington</td>
<td>0.9%</td>
<td>75.3%</td>
<td>97.5%</td>
<td>0.0%</td>
<td>1.6%</td>
<td>24.8%</td>
</tr>
</tbody>
</table>
## Shipping Rates for Wheat by Survey Respondents, Dec 2010 – Mar 2011

<table>
<thead>
<tr>
<th>Region</th>
<th>Average Rate in Cents per Bushel (to Portland)</th>
<th>[\text{Truck}]</th>
<th>[\text{Truck-Barge}]</th>
<th>[\text{Rail}]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Oregon</td>
<td>$0.56</td>
<td>$0.30</td>
<td>$0.54</td>
<td></td>
</tr>
<tr>
<td>Northern Idaho</td>
<td>$1.50</td>
<td>-</td>
<td>$0.74</td>
<td></td>
</tr>
<tr>
<td>Southern Idaho</td>
<td>$0.76</td>
<td>-</td>
<td>$0.90</td>
<td></td>
</tr>
<tr>
<td>No. Washington</td>
<td>$0.45</td>
<td>-</td>
<td>$0.55</td>
<td></td>
</tr>
<tr>
<td>So. Washington</td>
<td>$1.34</td>
<td>-</td>
<td>$0.58</td>
<td></td>
</tr>
<tr>
<td>Pacific Northwest</td>
<td>$0.92</td>
<td>$0.30</td>
<td>$0.66</td>
<td></td>
</tr>
</tbody>
</table>

Rates before the lock outage:
- **Truck** - $0.89 (3.4% ↑)
- **Rail** - $0.65 (1.5% ↑)
Wheat Industry Impacts

- Wheat Industry
  - Increased truck and rail shipments
    - Total shipments decreased by 1.6 million bushels
      - High prices and demand during Fall 2010
      - Waited for locks to open
    - Some firms expressed concern with rail service
  - 4 elevators halted all wheat shipments
    - Truck and rail were too expensive
    - Shipped in anticipation of lock outage
      - Barge shipments in summer and fall: 32% above average
Shipping Impacts and Activities

**Barge Line Impacts**
- Laid off employees
- Reduced employees’ work hours
- Continued service below The Dalles
- Barging tugs were called to Portland

**Rail Line Impacts**
- Increased cargo loads (going east and west)
- Increased employees’ hours to handle large loads and increased railcar numbers
- Increased fuel and employees’ costs
Industrial Impacts and Activities

- Petroleum companies
  - Reserved about procedures: proprietary information
  - Shipped about 60% of product by tanker truck
    - More economical and convenient than rail
    - No pipeline use
    - “Smooth sailing”
    - No reported fuel shortages, price gouging or price hikes due to the lock outage
All prices in the Pacific Northwest rose in unison.

Rising gas prices were not an effect of the lockoutage, but rather a result of unrest in the Middle East.
Industrial Impacts and Activities

- Forestry Industry
  - Truck and rail transportation (15% by rail)
  - Paper firms used forest products from Eastern Washington and from local sources
  - Barge lines were able to continue shipments
    - From Bingen, WA
  - Barge shipments during the summer and fall were 75% above average
    - Allowed a build up of inventories
Return of Traffic to the River

<table>
<thead>
<tr>
<th></th>
<th>April</th>
<th>May</th>
<th>June</th>
</tr>
</thead>
<tbody>
<tr>
<td>Historical Average</td>
<td>521,238</td>
<td>520,275</td>
<td>714,720</td>
</tr>
<tr>
<td>Pre Lock Outage</td>
<td>545,431</td>
<td>461,400</td>
<td>527,255</td>
</tr>
<tr>
<td>Post Lock Outage</td>
<td>958,523</td>
<td>803,900</td>
<td>631,083</td>
</tr>
</tbody>
</table>
Monthly Tonnage Shipped Downriver

Pre Lock Outage

<table>
<thead>
<tr>
<th></th>
<th>September</th>
<th>October</th>
<th>November</th>
</tr>
</thead>
<tbody>
<tr>
<td>Historical Total Average</td>
<td>464,998</td>
<td>604,044</td>
<td>555,725</td>
</tr>
<tr>
<td>Pre Outage Total</td>
<td>635,894</td>
<td>627,164</td>
<td>623,601</td>
</tr>
<tr>
<td>Historical Wheat Average</td>
<td>301,995</td>
<td>402,270</td>
<td>386,875</td>
</tr>
<tr>
<td>Pre Outage Wheat</td>
<td>498,162</td>
<td>482,300</td>
<td>491,955</td>
</tr>
</tbody>
</table>
Monthly Tonnage Shipped Downriver
Post Lock Outage

<table>
<thead>
<tr>
<th>Month</th>
<th>Historical Total Average</th>
<th>Post Outage Total</th>
<th>Historical Wheat Average</th>
<th>Post Outage Wheat</th>
</tr>
</thead>
<tbody>
<tr>
<td>April</td>
<td>521,238</td>
<td>958,523</td>
<td>347,833</td>
<td>758,085</td>
</tr>
<tr>
<td>May</td>
<td>520,275</td>
<td>803,900</td>
<td>359,607</td>
<td>663,230</td>
</tr>
<tr>
<td>June</td>
<td>714,720</td>
<td>631,083</td>
<td>259,631</td>
<td>488,100</td>
</tr>
</tbody>
</table>

Tons
The Rest of the Story

- Continue to document the return of traffic to the river
- Calculate total costs to shippers and commodity industries
- Calculate energy and emission impacts of lock outage