

Your Assignment

Determine the best method of shipment of 60,000 tons of coal from Duluth MN, to Cleveland, OH.

– Analyze

- Ship
- Train
- Truck

– Direct Effects

- Fuel consumption
- Air pollution
- Wildlife effects

- Secondary effects
 - See what you come up with

- Assume
 - Any return train or truck trips are empty
 - Use state truck speed limits

- Present results in English Units!!!
 - Most environmentally-friendly
 - Most economical

- Due October 30





Stewart J. Cort (Interlake Steamship)



Indiana Harbor (American Steamship)



Presque Isle (Great Lakes Fleet)



Edwin M. Gott (Great Lakes Fleet)



Mesabi Miner (Interlake Steamship)

Duluth MN to Cleveland OH

- 60,000 tons
- 833 miles
- Speed = approx. 17 mph
- Fuel= 42 gallons/mile (diesel)
- CO = 2.39 lbs/mile
- HC = 0.81 lbs/mile
- NOx = 17.63 lbs/mile
- Potential accidents
 - Fatalities = 0.00012/one-way
 - Injuries = 0.00028/one-way
 - Collisions/groundings = 0.0049/one-way
- Crew = 30
 - Captain = \$120,000 - \$160,000 / year
 - Deckhand = \$40,000 / year

- One loaded “footer” =
 - 6 trains, 100 100-ton cars
 - 2308 trucks, 26 tons per truck