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# Development of Second Generation Multiple Product Southern Timber Market Model

## **Multiple Product Demand Model**

Southern Forest Resource  
Assessment Consortium

# Multiple Products

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- Diverse Wood Product Manufacturing
  - > softwood solidwood 36%
  - > softwood pulpwood 28%
  - > hardwood pulpwood 24%
- Movement from Solidwood to Composite Products
- Increasing Competition for Timber Inputs
  - > competition over wide range of diameters
  - > demand for pulpwood and solidwood related

# Multiple Product Demand Model

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- Timber Supply and Demand Depend on Product Interactions
- Develop Multiple Product Demand Model
  - > link wood product demand and stumpage demand
  - > price transmission effects b/w wood products & stumpage
  - > allocation of timber harvest
  - > market adjustments
  - > interactions b/w markets

# Task 1: Collect Data

- Task 1: Collect Data and Assemble Database
- Data Types
  - > production output and prices
  - > production inputs and prices
  - > substitutes
  - > trade flows information
- Data Sources
  - > TAMM/NAPAP, BLS, Census, SM, TMS  
USDA Forest Service, trade and industry associations  
and trade statistics
- Assemble Databases
- Statistical Analysis and Data Description

# Task 2: Estimate Demand

- Model Demand in Profit Function Framework
- Profits Function of Prices
  - > production outputs, inputs, and substitutes
- Estimate System of Functions
  - > profit function
  - > output supply functions
  - > input demand functions
  - > joint estimation
- Verify Model Parameters
- Calculate Own Price and Cross Price Effects
- Decompose Demand Rate Change into
  - > output, input, own and cross price effects
  - > capital technology effects

# Task 3: Develop Inputs for Timber Market Model

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- Econometric Estimation Results
  - > fine level of detail and complexity
  - > difficult to incorporate in forecasting models
- Choose Parameters
  - > well explain market
  - > can be consistently forecasted for two decades
- Programming

# Benefits

- Provide Insights
  - > links between product price changes, stumpage prices and availability
  - > substitution between production inputs
  - > stumpage demand sensitivity to price changes
  - > capital technology effects
- Endogenize Demand
- Complement Multiple Product Structure
- Indicate Future Demand for Various Timber Quantities and Qualities
- Indicate Promising Market Strategies