

MISSOURI RIVER PUBLIC USE ASSESSMENT

Collecting, Managing and Presenting the Results

Steve Sheriff
Rochelle Renken
Tom Treiman
Tom Kulowiec
Giancarlo Rhodes



What Was The Missouri River Public Use Assessment?

811 miles from St. Louis to Gavins Point Dam

- ▣ Estimate amount and types of public use along the river
- ▣ Describe river users
- ▣ Estimate the economic value of the river



Why Spend So Much Time And Effort?

Information need

- ▣ After the floods of 1993, 1995 and 1996, new areas and accesses allowed greater access to the Missouri River
 - 20 new public lands
 - 17 new accesses
- ▣ Northwest Region - new properties acquired as a result of Army Corps of Engineer purchases
- ▣ Missouri River management decisions and conflicting opinions

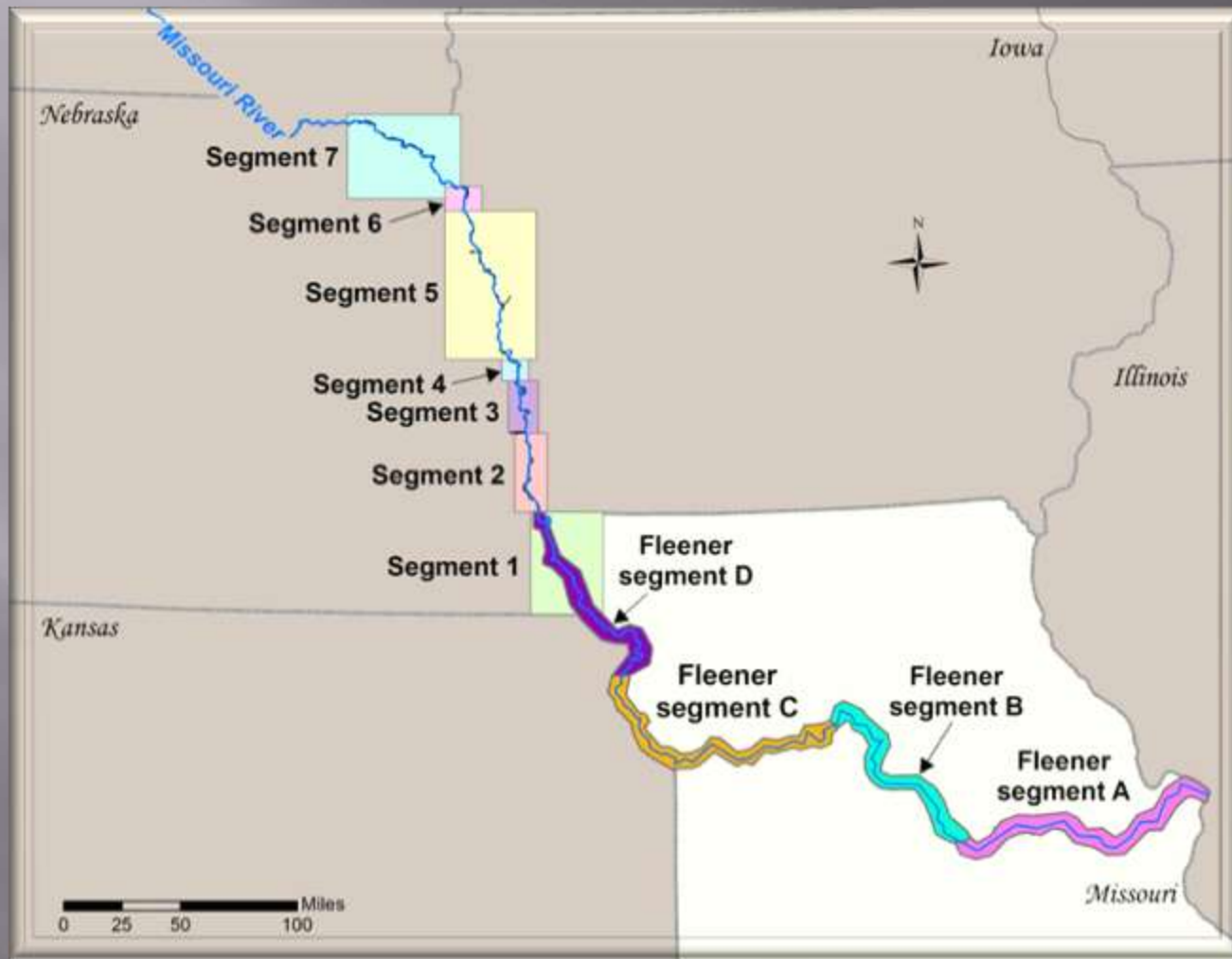
What Did Those Clerks Do?

For 13 months in 2004 and 2005, we collected information along 811 miles of the Missouri River

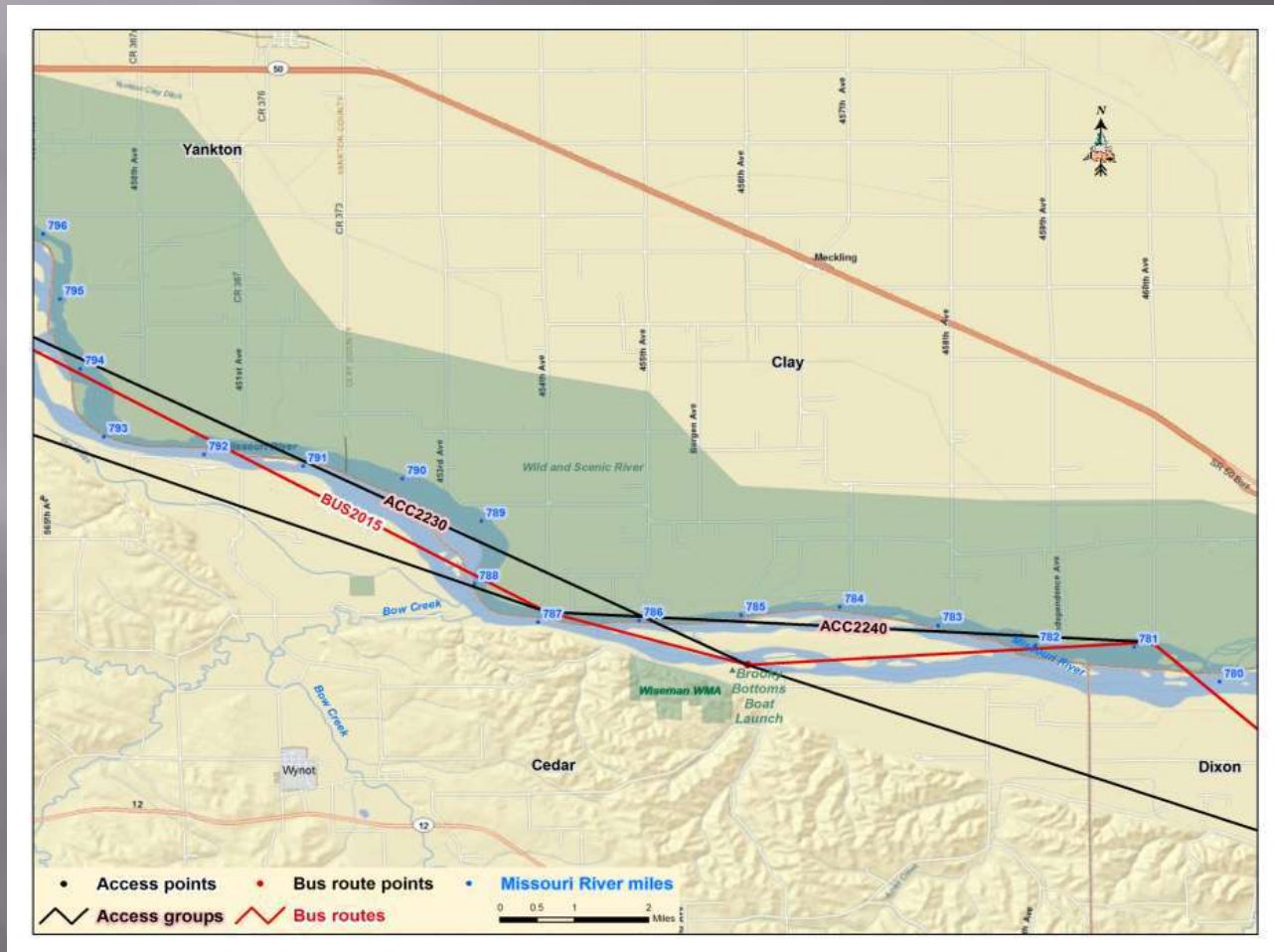
- ▣ Interviewed users at accesses, parks, conservation areas, and national wildlife refuges



Where were those clerks?



What the heck are Access point, access groups and bus routes?



How Did We Turn All That Data Into Useful Results?

- ▣ 111,700 interviews at accesses and areas
- ▣ 88,900 parties

- ▣ Users will want to select:
 - Location
 - Time
 - Variable
- ▣ Users may not:
 - Have SAS
 - Want to wait for SAS to produce the estimates

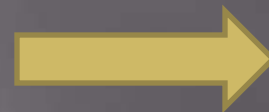
Solution: Produce ALL the estimates ahead of time

$$t_{ijkl} = \sum_{p=1}^P p_{ijkl} y_{ijkip},$$

$$\hat{t}_{ij} = \frac{N_{ij}}{n_{ij}} \sum_{k=1}^{m_{ij}} \frac{M_{ijk}}{m_{ijk}} \sum_{l=1}^{m_{ijk}} t_{ijkl}.$$

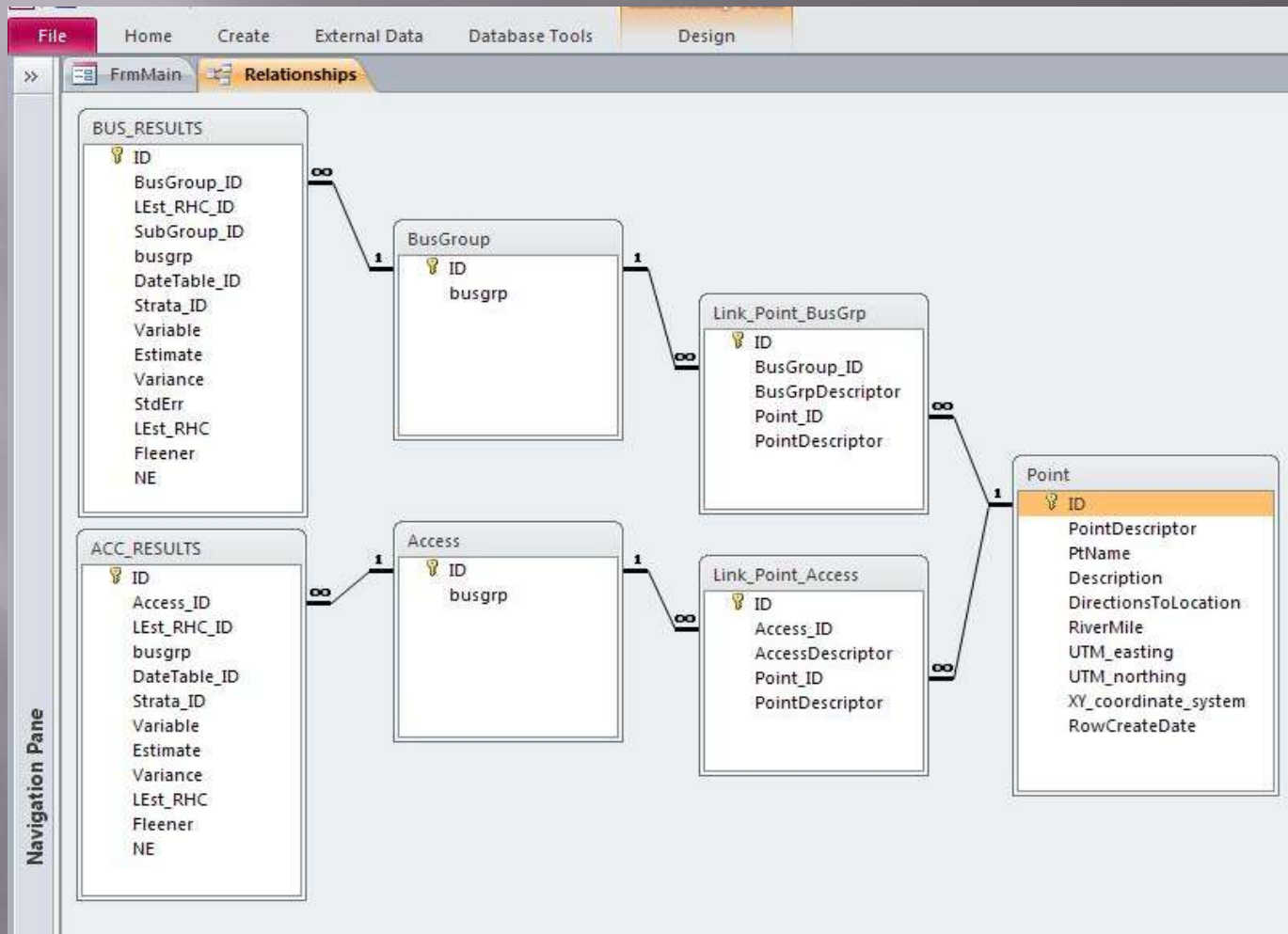
$$s_{ijk}^2 = \frac{\sum_{l=1}^{m_{ijk}} (t_{ijkl} - \bar{t}_{ijk})^2}{m_{ijk} - 1},$$

$$s_t^2 = \frac{\sum_{k=1}^{m_{ij}} \left(\frac{M_{ijk}}{m_{ijk}} \sum_{l=1}^{m_{ijk}} t_{ijkl} - \frac{\hat{t}_{ij}}{N_{ij}} \right)^2}{n_{ij} - 1}.$$



1.98
million
estimates

Building the database



BUILDING A DATASET BASED ON ACCESSES

Missouri River Public Use Data Access Utility

Select the data you want to retrieve

SELECT EITHER ACCESS OR BUSGROUP

Sum Across Location
Location (ctrl+click for multiple select)

Sum Across Strata
Strata (ctrl+click for multiple select)

Sum Across Interval
Interval (ctrl+click for multiple select)

Group: (ctrl+click for multiple select)

Hunting/Unknown Caught
 Hunting/Unknown Kept
 Hunting/Unknown Harvest (# of Parties)
 Non-consumptive Activity (# of Visitors)
 Non-consumptive Time
 Summation Activity (# of Visitors)
 Time Summation
 Summation Harvest (# of Parties)
 Summation General
 Age Classification
 Race Classification
 Gender Classification
 Disability Classification
 Second Vehicle Type
 Trip Status Type

Display SQL Statement Clear

Generate Printed Report Export Data to Excel Quit

Location | Points currently Selected
ACC9005 A3715_0

Missouri River Public Use Data Access Utility

Data Selection and Reporting

Click here to see relations)

Name (A)	Easting	Northing	River Mile	
R1815_0	Fort Osage	397,148.37	4,338,549.45	337.20
R1265_0	Franklin Island	524,294.61	4,315,250.53	195.20
R2925_0	French Bottoms Access	339,434.98	4,405,134.83	450.40
R0610_0	Gasconade	625,898.11	4,280,982.54	104.40
A0001_0	Grand Pass	473,028.94	4,346,855.41	272.40
A0002_0	Grand Pass CA Main Office Parking Lot	472,978.96	4,346,847.53	272.40
A0002_0	Grand Pass CA Observation Tower Intersection	475,692.42	4,347,555.33	268.40
A3715_0	H.F. Thurnau CA	290,729.68	4,443,400.68	308.70
R4050_0	Hamburg Mitchell Access	267,993.46	4,499,174.10	554.20
R1160_0	Hartsburg	557,429.19	4,284,646.79	159.90
R0590_0	Hermann Boat Ramp	636,144.84	4,285,591.11	97.70
R0591_0	Hermann Sand and Gravel	635,673.18	4,285,971.78	98.00
R6123_0	Hightree - Pop&Docs	211,492.71	4,655,905.82	691.20
R3823_0	Hoot Owl Bend Public Fishing Access	277,506.09	4,466,070.30	525.20
R5923_0	Huff-Warner	240,064.54	4,646,201.70	661.00
R3780_0	Indian Cave	285,910.34	4,458,251.35	316.90
R3785_0	Indian Cave State Park	283,878.54	4,459,262.90	318.30
R3767_0	Jaro Farms "Ditch 7"	287,122.67	4,458,871.65	316.10
R2780_0	Jentell Bones Access	511,318.41	4,199,276.41	417.30

Survey Locations (Access and Bus Routes):

ACC9005 Go to Data Selection and Reporting Clear Quit

RESULTS FROM REPORT BUILDER

Acc	Loc	Loc_RFC	Item	Time	Week	Summation
ACC0048	80_RHC02	Caught Black Grouper	April 28, 2004 to May 11, 2004	Weekends	0.00	
ACC0049	80_RHC03	Caught Blue Catfish	April 24, 2004 to May 11, 2004	Weekends	670	
ACC0050	80_RHC03	Caught Bluegill	April 24, 2004 to May 11, 2004	Weekends	0.00	
ACC0051	80_RHC04	Caught Catfish spines	April 24, 2004 to May 11, 2004	Weekends	0.00	
ACC0052	80_RHC05	Caught Channel Catfish	April 24, 2004 to May 11, 2004	Weekends	671	
ACC0053	80_RHC03	Caught Crappie spines	April 24, 2004 to May 11, 2004	Weekends	0.00	
ACC0054	80_RHC05	Caught Flathead catfish	April 24, 2004 to May 11, 2004	Weekends	21.88	
ACC0055	80_RHC03	Caught Green Sunfish	April 24, 2004 to May 11, 2004	Weekends	0.00	
ACC0056	80_RHC06	Caught Lake Striped Bass	April 24, 2004 to May 11, 2004	Weekends	0.00	
ACC0057	80_RHC03	Caught Largemouth Bass	April 24, 2004 to May 11, 2004	Weekends	0.00	
ACC0058	80_RHC07	Caught Northern Pike	April 24, 2004 to May 11, 2004	Weekends	0.00	
ACC0059	80_RHC03	Caught Rock Bass	April 24, 2004 to May 11, 2004	Weekends	0.00	
ACC0060	80_RHC03	Caught Striped Bass	April 24, 2004 to May 11, 2004	Weekends	0.00	
ACC0061	80_RHC03	Caught Sunfish	April 24, 2004 to May 11, 2004	Weekends	0.00	
ACC0062	80_RHC07	Caught Warmouth Bass	April 24, 2004 to May 11, 2004	Weekends	0.00	
ACC0063	80_RHC03	Caught Spotted Bass	April 24, 2004 to May 11, 2004	Weekends	0.00	
ACC0064	80_RHC05	Caught Striped Bass	April 24, 2004 to May 11, 2004	Weekends	0.00	
ACC0065	80_RHC03	Caught Striped Bass	April 24, 2004 to May 11, 2004	Weekends	0.00	
ACC0066	80_RHC03	Caught Trout spines	April 24, 2004 to May 11, 2004	Weekends	0.00	
ACC0067	80_RHC03	Caught Walleye	April 24, 2004 to May 11, 2004	Weekends	0.00	

Missouri River Public Use Assessment Data Report

Missouri River Public Use Assessment Data Report

HF Thurnau - all year

Summed Strata: Weekdays, Weekends

Summed Time Intervals: Jan. 1, 2004 to Jan. 30, 2004, Jan. 31, 2004 to Feb. 27, 2004, Feb. 28, 2004 to March 26, 2004, March 27, 2004 to April 23, 2004, April 24, 2004 to May 21, 2004, May 22, 2004 to June 18, 2004, June 19, 2004 to July 16, 2004, July 17, 2004 to Aug. 13, 2004, Aug. 14, 2004 to Sept. 10, 2004, Sept. 11, 2004 to Oct. 8, 2004, Oct. 9, 2004 to Nov. 5, 2004, Nov. 6, 2004 to Dec. 3, 2004, Dec. 4, 2004 to Dec. 31, 2004, Jan. 1, 2005 to Jan. 28, 2005

Loc_Code	Act_Cat	Activity	Estimate	Variance
ACC9005	Summation General	ID	7,332.09	270,697.50
ACC9005	Summation General	Total Hours	38,978.78	53,376,832.22
ACC9005	Summation General	Number of Parties	3,947.95	66,184.72

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What Did We Learn?

The Big Picture

- ▣ 2.49 million visits
 - 89.3% to public areas and accesses
 - 8.2% at residences
 - 1.9% on excursion boats
 - 0.5% at clubs
 - 0.1% at tournaments
- ▣ 1.1 million parties at public areas and accesses
- ▣ 9.2 million hours including
 - 6.5 million at accesses and areas
 - ▣ Camping – 33% of hours
 - ▣ Fishing – 22% of hours
 - ▣ Boating – 11% of hours

$$\Sigma x_i$$

What Did We Learn?

The Big Picture

- ▣ Users at accesses and areas engaged in 71 activities
 - Sightseeing - 29% of visits
 - Fishing - 24% of visits
 - Boating - 12% of visits
 - Hunting - 5% of visits
- ▣ 49 species of fish were caught
 - Catfish most frequently caught fish
 - 309,000 catfish caught
 - Estimated harvest rate of 22 catfish/100 hrs
- ▣ Deer hunting - 2.1% of visits
- ▣ Waterfowl harvest - 33,500

What Did We Learn? Socio-Demographics

- ▣ Age
 - Under 18 12.5%
 - 18-24 Years Old 9.8%
 - 25-34 Years Old 15.1%
 - 35-44 Years Old 19.7%
 - 45-64 Years Old 30.6%
 - 65 or Older 11.9%
- ▣ Male 72.2%
- ▣ White 93.0%
- ▣ Hunting\Fishing\Trapping Permit 49.7%

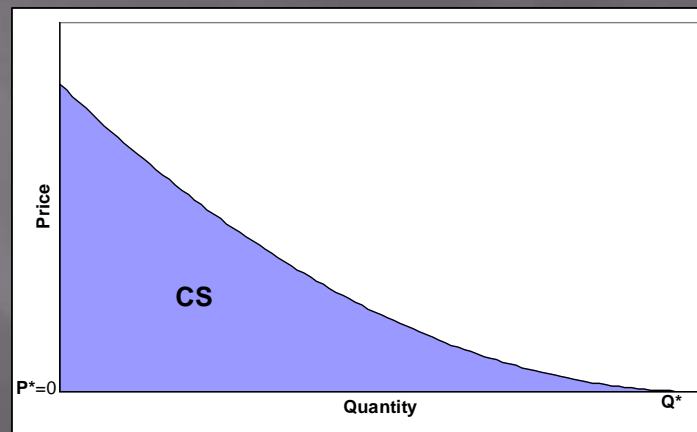


What Is Consumer Surplus?

- ▣ Extra “happiness” that a user gets when they pay less than their own maximum price

Or

- ▣ The area under the demand curve



Travel Cost Method

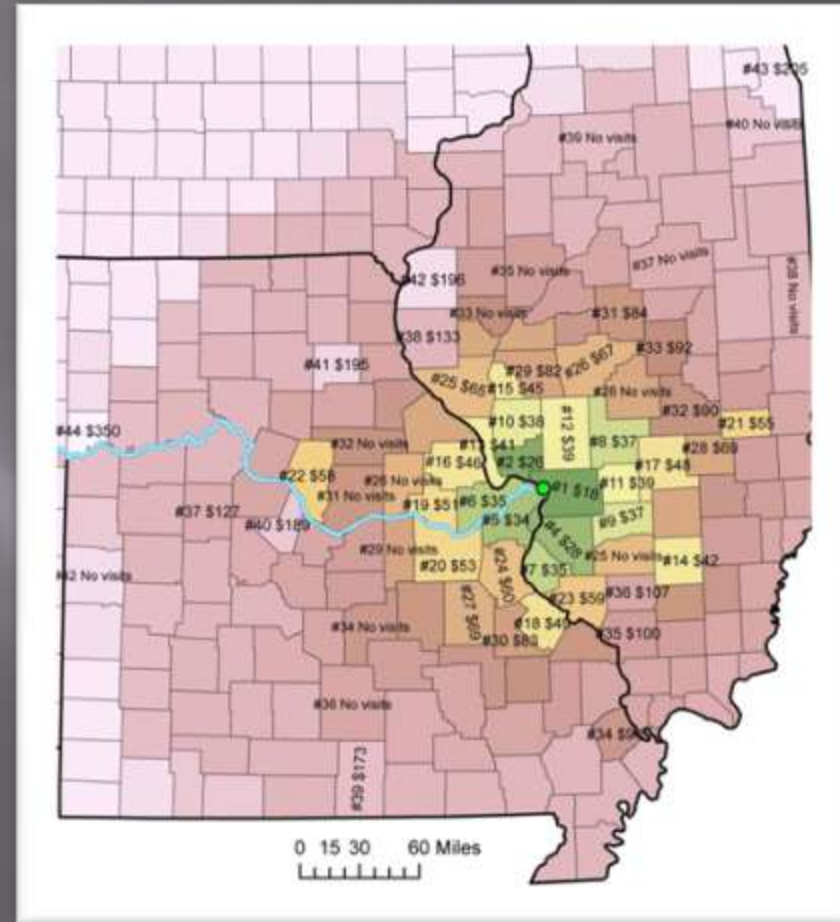
$$\log\left(\frac{T_j}{P_j}\right) = \beta_0 + \beta_{tc}TC_j$$

$$+ \sum_{k=1}^m \beta_k SiteType_k$$

$$+ \sum_{k=1}^m \beta_{TCk} SiteType_k * TC$$

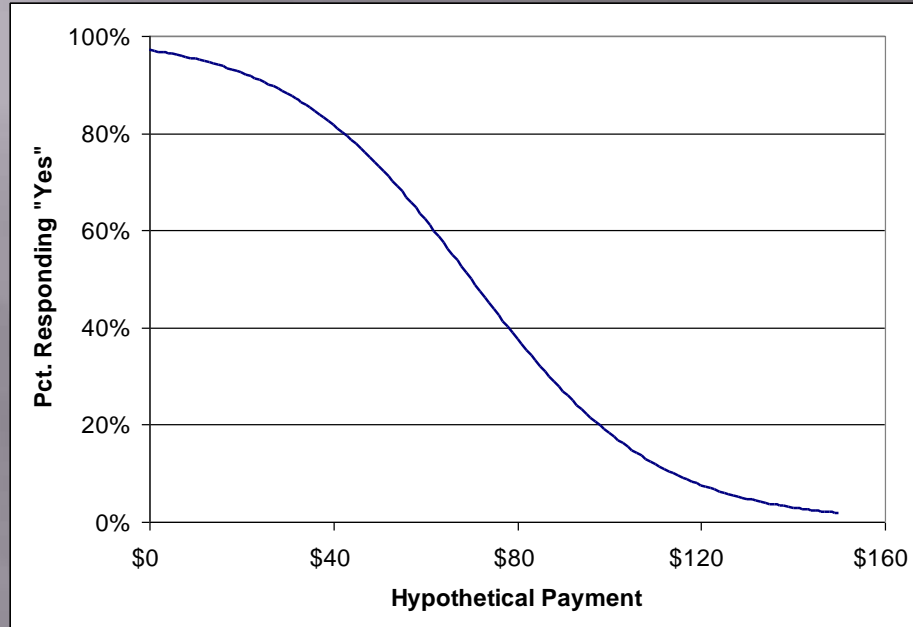
$$+ \sum_{i=1}^n \beta_i Segment_i$$

$$+ \sum_{i=1}^n \beta_{TCi} Segment_i * TC_j$$



$$CS_i = -1 / (\beta_{tc} + \sum_{k=1}^m \beta_{TCk} SiteType_k + \sum_{i=1}^n \beta_{TCi} Segment_i)$$

Discrete Choice Method



$$\Pr\left(\frac{YES_i}{1 - YES_i}\right) = \beta_0 + \beta_{Bid} \$B_i + \beta_2 x_{1i} + \dots + \beta_n x_{ni}$$

$$WTP = \frac{\beta_0}{\beta_{Bid}} + \frac{\beta_2}{\beta_{Bid}} x_1 + \dots + \frac{\beta_n}{\beta_{Bid}} x_n = A_0 + A_1 x_1 + \dots + A_n x_n$$

What Did We Learn? The Big Picture

- ▣ \$ 20.1 million to \$38.7 million total economic benefits over the 13 month assessment
 - \$18.5 million to \$35.7 million annual economic benefits in 2004
 - \$6.2 million to \$12.2 million in Nebraska in 2004
 - \$12.3 million to \$23.6 million in Missouri alone in 2004



What Did We Learn? The Big Picture

- ▣ \$39.1 million annual economic impact in Missouri (using National Survey expenditures)
 - 490 full-time equivalent jobs
 - \$2.9 million state/local taxes generated
- ▣ \$28.9 million annual economic impact in Nebraska
 - 370 full-time equivalent jobs
 - \$2.1 million state/local taxes generated



What Did We Learn? The Little Picture

Columbia Bottom CA

Total # of visits	64,260
Total # of hours	65,953 1 hr/visit
# of Activities	21
Most Popular Activity	Sightseeing 68% of all visits
# of Fishing Visits	3,892 6% of all visits
# of Hunting Visits	2,032 3% of all visits
All Non-consumptive Activities	58,011 90% of all visits



How Are The Results Being Used?



- ▣ Completed requests for information from:
 - Missouri River Relief
 - Iowa DNR
 - Water Quality Coordinating Committee
 - Consulting firms
- ▣ Used by communities to show the importance of the river
- ▣ MRERP

A serene sunset scene over a calm lake. The sky is filled with vibrant, streaked clouds in shades of orange, red, and purple, transitioning to a deep blue at the top. The sun is low on the horizon, creating a bright glow. The water in the foreground is still, reflecting the colors of the sky. Silhouetted trees line the shore in the background, and a large tree is visible on the right side of the frame.

Questions?

Thank you.