

Valuing forest-based recreation

Forest-level analysis to determine the relative value of various recreation activities



Agenda

- Introduction
 - Value
 - Significance
 - Valuation Methods
 - Research Question
- Study Areas
- Data
- Methods
- Results
- Conclusions

Introduction

- Few have tried to define ‘value’, those that have claim that resources are valuable in relation to specific market environment
- Assessing value
 - Utility theory
Consumers spend their money to maximize their satisfaction they get from using a resource
 - Marginal utility theory
Refers to the satisfaction people get from possessing one extra unit of a resource
- Typically rely on monetary assessments and actual possession (use) of a resource

Significance

- Previous methods of assigning value to forests have relied on timber prices
 - Using this method today ignores many uses of national forests
 - Would yield land values of about 30 per acre
- Forests as a recreation resource
- Valuing forest as a recreation resource requires new methods



Recreation in the Forest

- Logging in southwestern forests is dwindling
- People now see the forests as a recreation resource rather than an extractive one
- Forests have both a use and non-use recreation value
 - Use value
The value people place on the current use of an activity
 - Non-use value
Attempts to account for an individual's possibility for future activity in a forest



Valuing Forest Resources

- Calculating value based on timber sales is becoming less meaningful while recreation use and therefore recreation value is increasing
- Other methods of valuation are necessary
 - Travel cost
 - Contingent valuation
 - GIS and recreation



Previous Valuation Methods

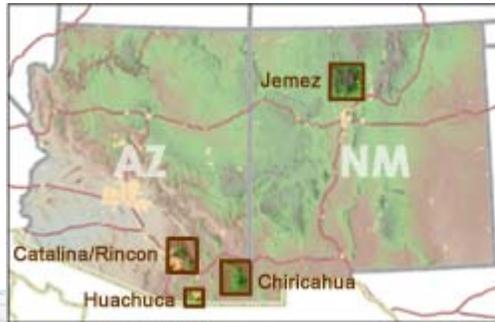
- Travel cost method
 - Revealed preference method
 - Cost to travel to a location is used as a proxy for its value
- Contingent Valuation
 - People are asked the maximum amount they are willing to spend for different recreation types in a particular landscape
- Previous GIS work in landscape valuation has involved classifying and ranking



Research Questions

- How do you value a spatially explicit recreation landscape?
- How do you integrate a variety of data layers with different metrics into a landscape based wildfire model?
- What are the requirements for including landscape in a spatial decision support system?

Study Areas



Chiricahua Mountains



Huachuca Mts



Catalina-Rincon Mountains



Jemez Mountains

Value of the Recreation Landscape in FCS-1

- Data
- Visibility and Euclidean distance analysis
- Data integration



Data for Recreation Value

- Recreation usage from the National Visitor Usage Monitoring program
 - Forest level data
 - Top 9 recreation activities
- U.S. Forest Service Cartographic Feature Files
 - Forest Service's Primary Base Series maps
 - Transportation, water bodies, administrative, and land ownership
- Gap species habitat richness (hunting)
 - Uses GAP vegetation as a proxy for species habitat
 - Questionable accuracy, but best available

Activities Used

Hiking or Walking	38.0%
Driving for Pleasure	18.6%
General/Other Relaxing	7.3%
Camping	3.7%
Picnicking	3.7%
Viewing Wildlife	3.7%
Off-Highway Vehicles	3.6%
Hunting	3.5%
Downhill Skiing	2.4%

Visibility and Euclidean Distance Analysis

Visibility Analysis

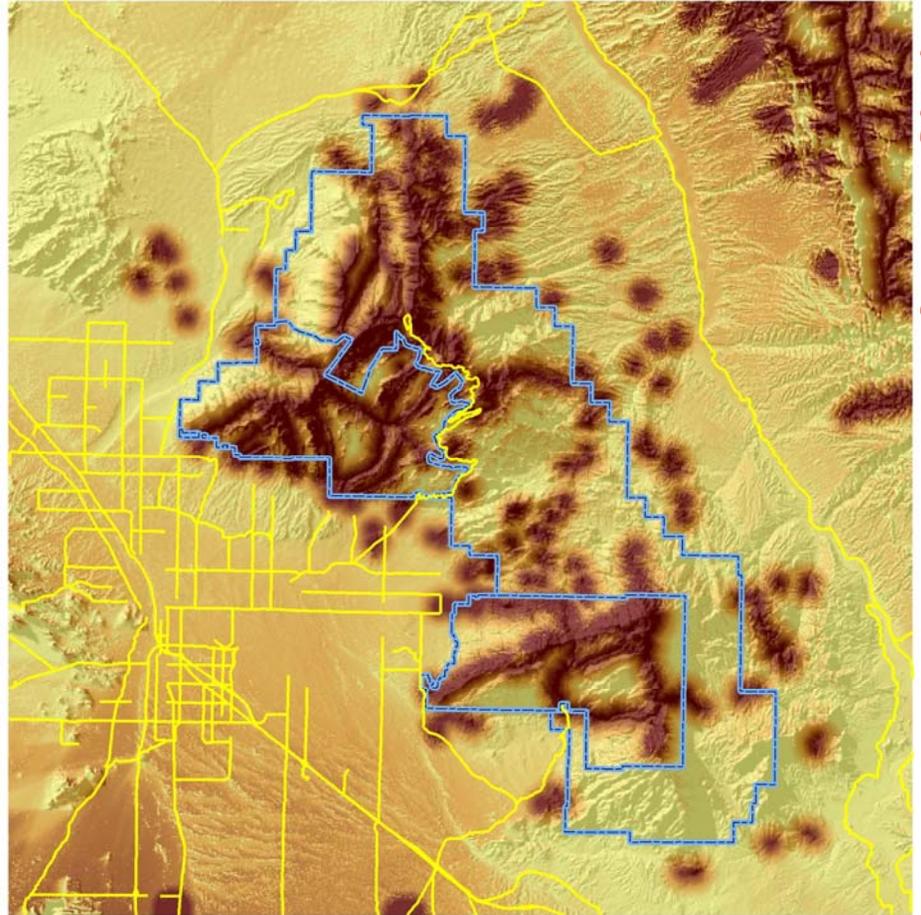
- Studies indicate that what people see while recreating is important
- Cumulative visibility surfaces were created for venues for each recreation type
 - How made
 - What they mean

Euclidean Distance Analysis

- Studies have also shown that areas closer to recreation features are more important than areas farther away
- Determines distance from a feature out to 2,000 meters

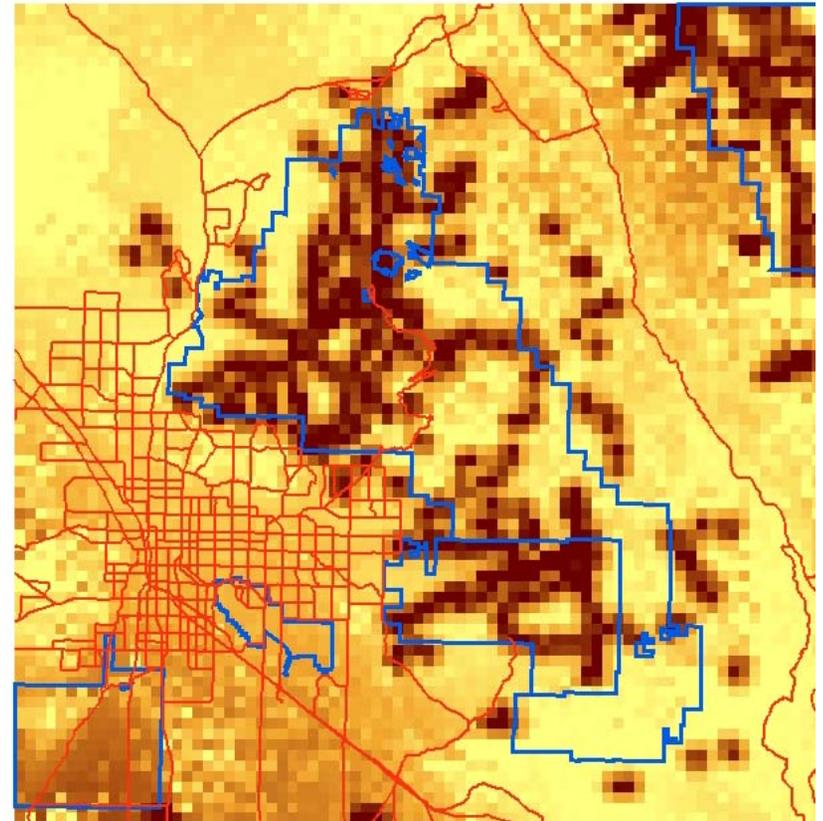
Creating the Recreation Value Layer

- Calculate Euclidean distance from each recreation type, up to 2 kilometers
- Calculate visibility from each recreation type
- Rescaled each layer to values between 0 and 1
- Added the Euclidean distance and visibility layers together



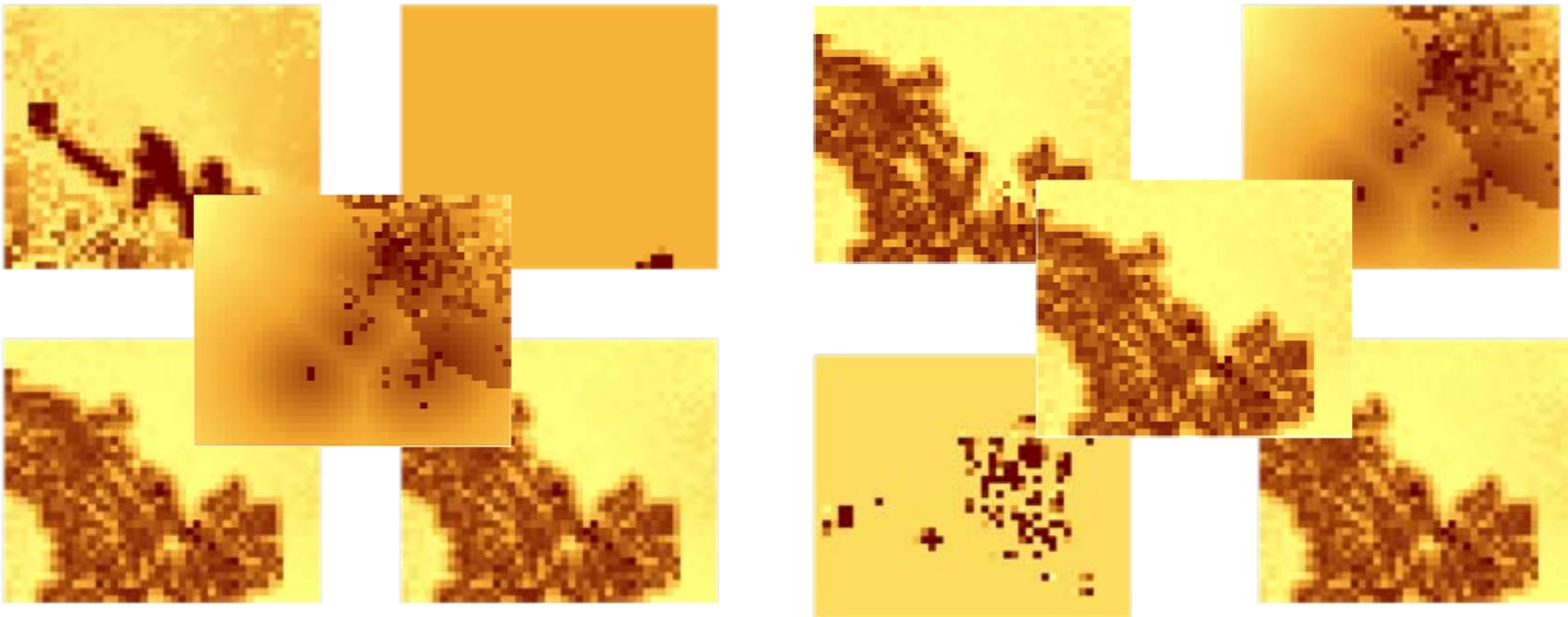
Creating the Recreation Value Layer

- Resampled to 1km grids
- Rescaled data from 0 – 1
- Multiplied by the proportion of visitors who participated in particular activities



Recreation Processing

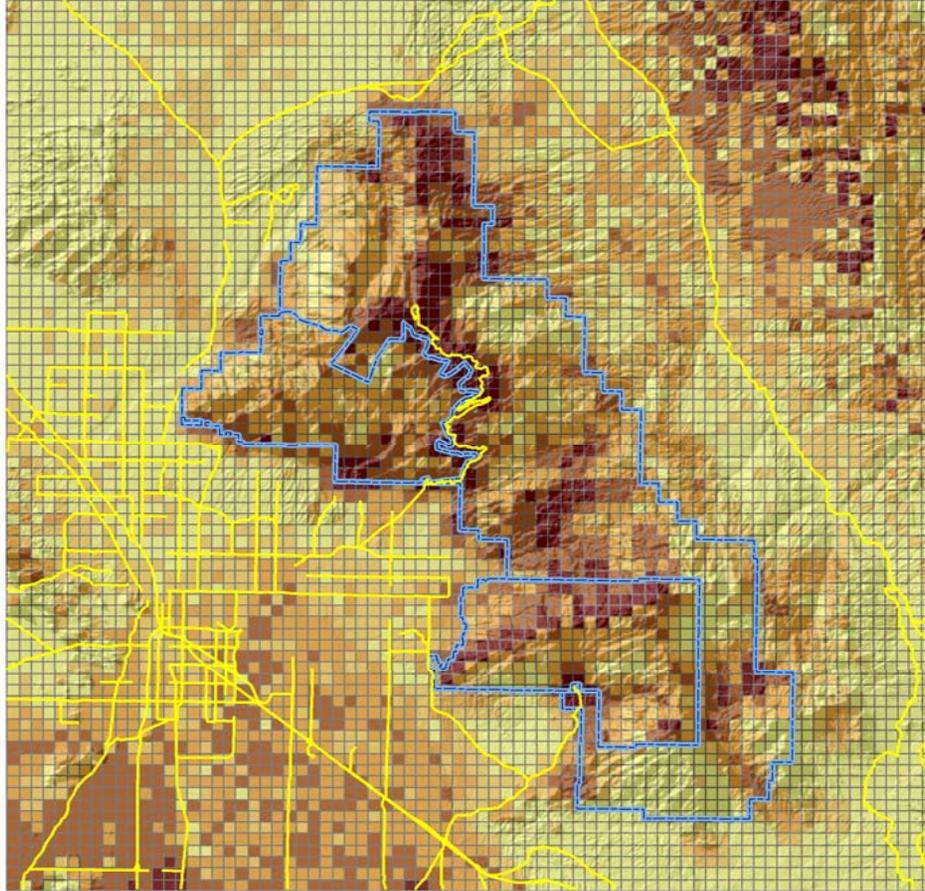
Bringing it all together



Individual recreation variables

Recreation Model

All layers





Conclusions

- Spatial representation of relative recreation values
 - Heavily dependent on access
 - Data is available for all national forests
 - Easy to implement
- Euclidean distance and visibility modeling of common recreation activities
- Values based on percent participation