Landscape Modeling and Geovisualization Workshop

Visualizing 30 years of Spatial and Temporal Landcover Changes in the James River Basin

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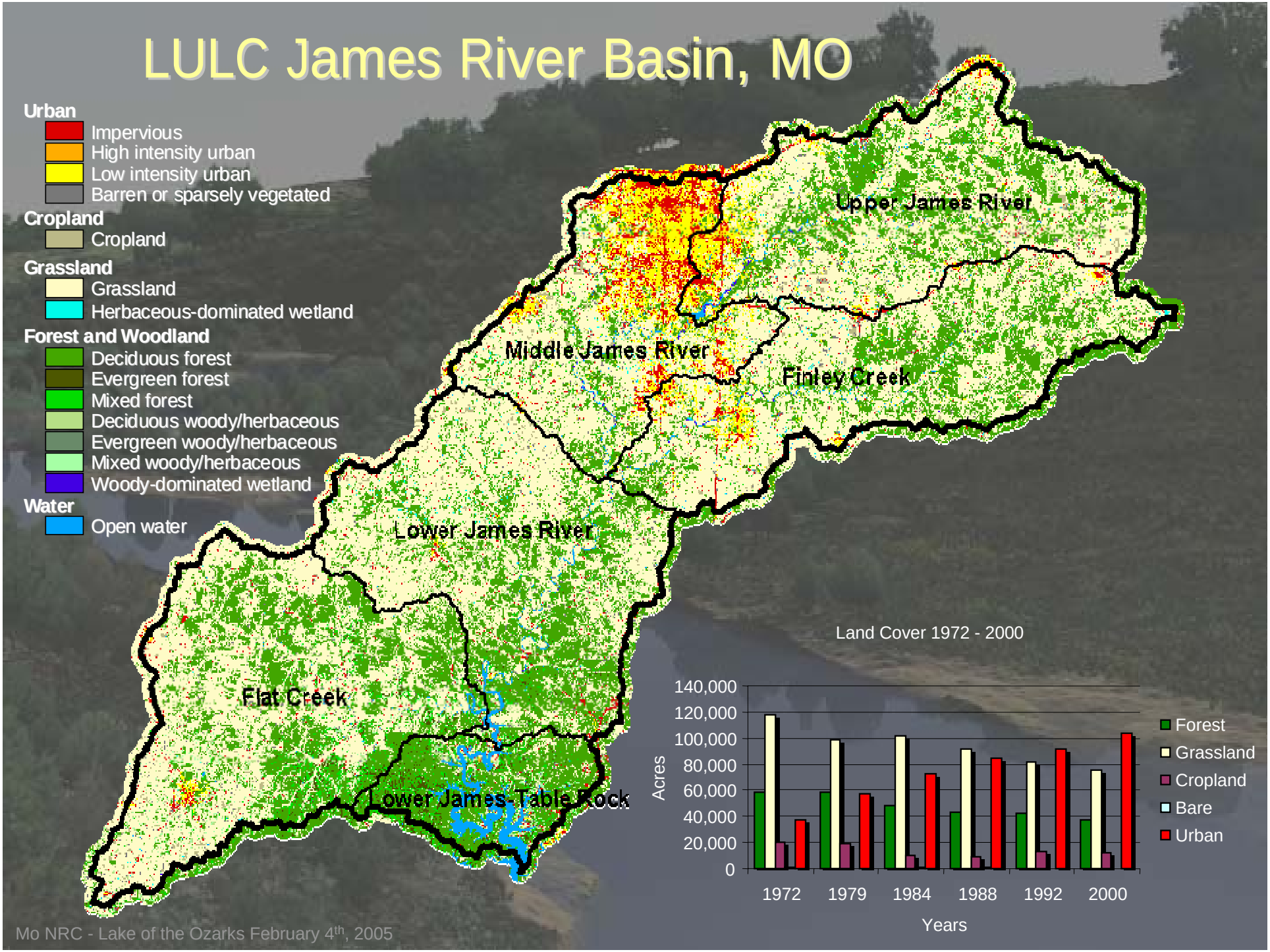
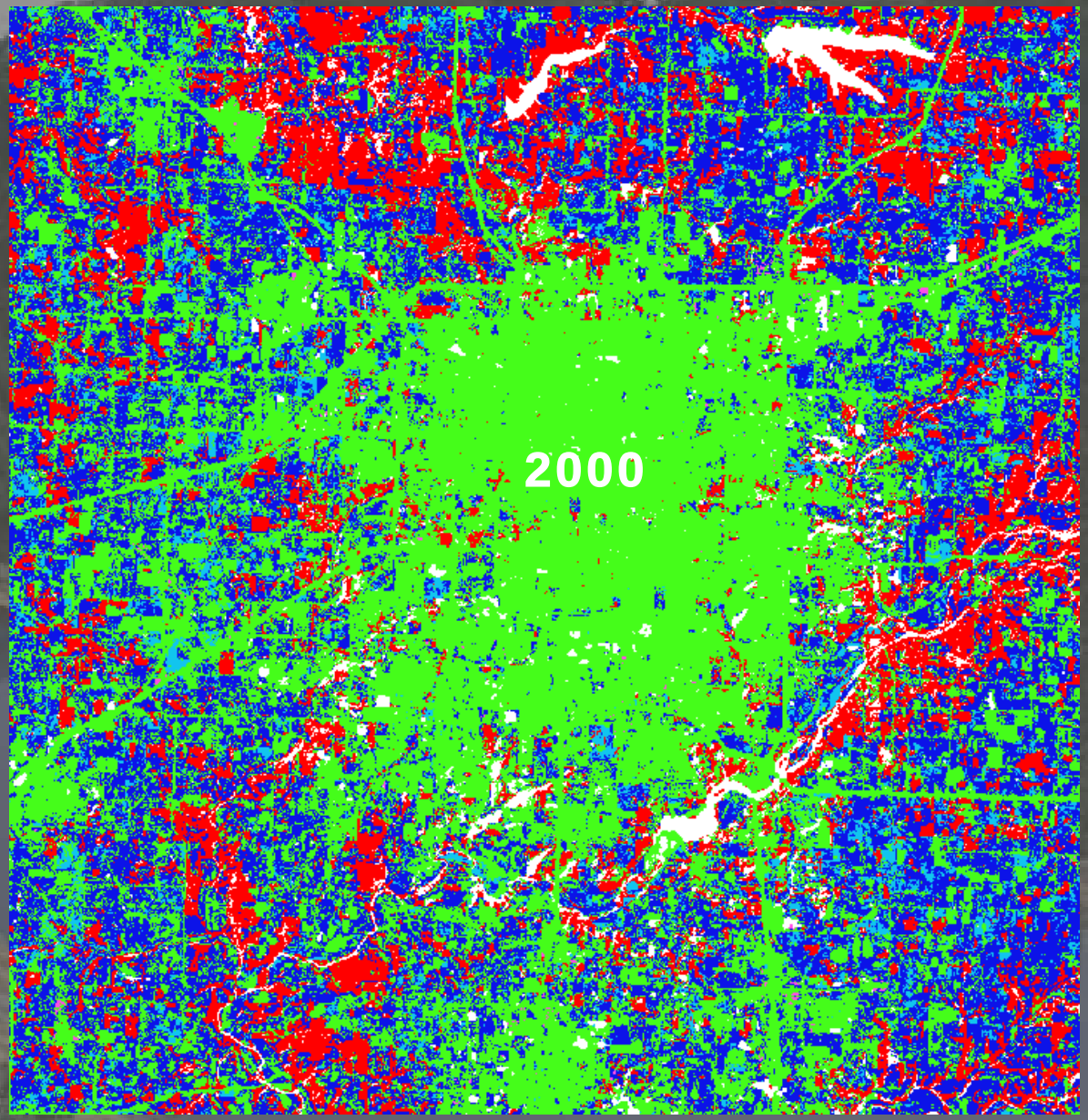
LULC James River Basin, MO



Mo NRC - Lake of the Ozarks February 4th, 2005

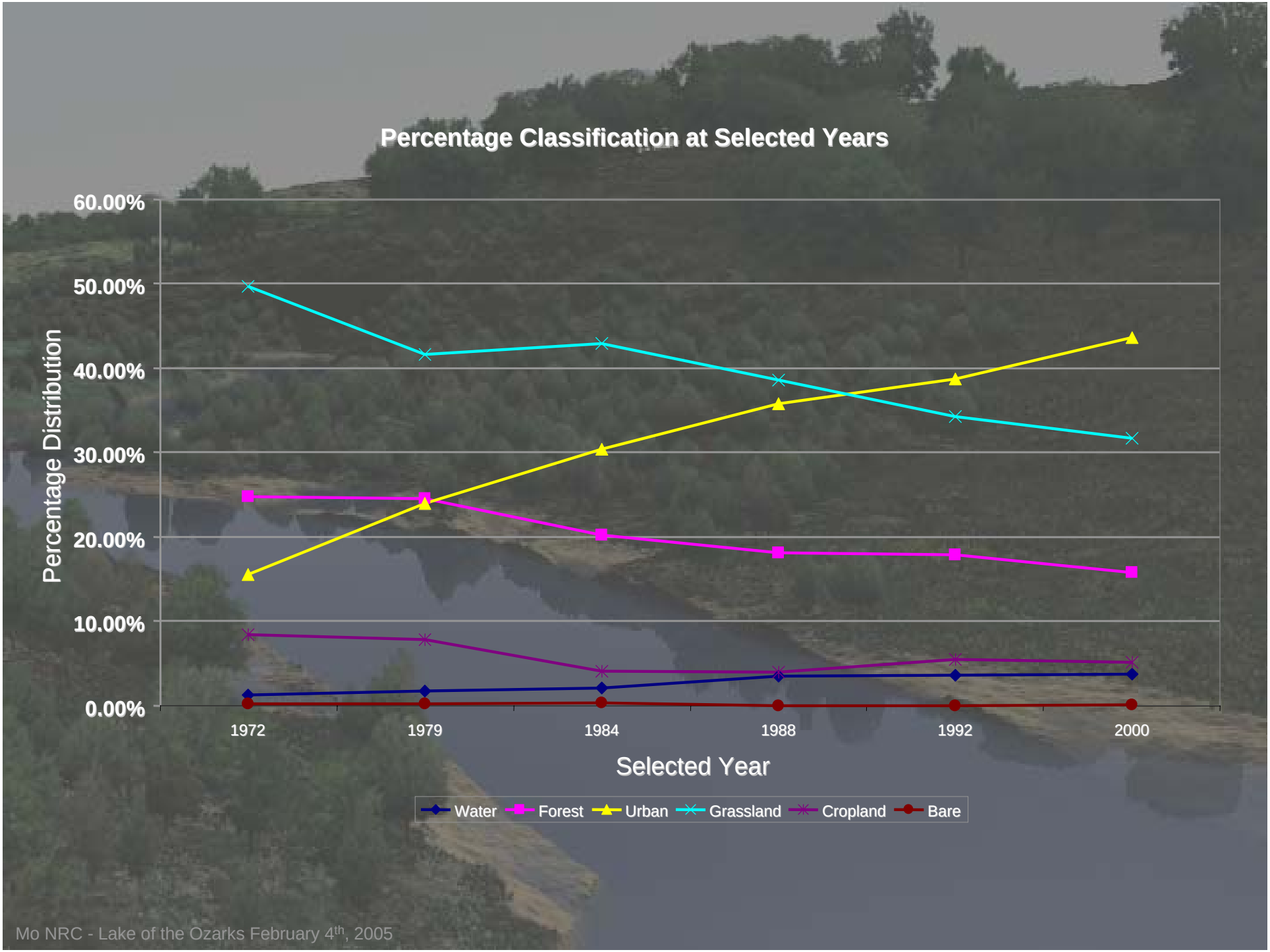
Datasets for Visualizations

Land use	Color
Water	White
Forest	Red
Urban	Green
Grassland	Blue
Cropland	Lt Blue
Bare	Pink

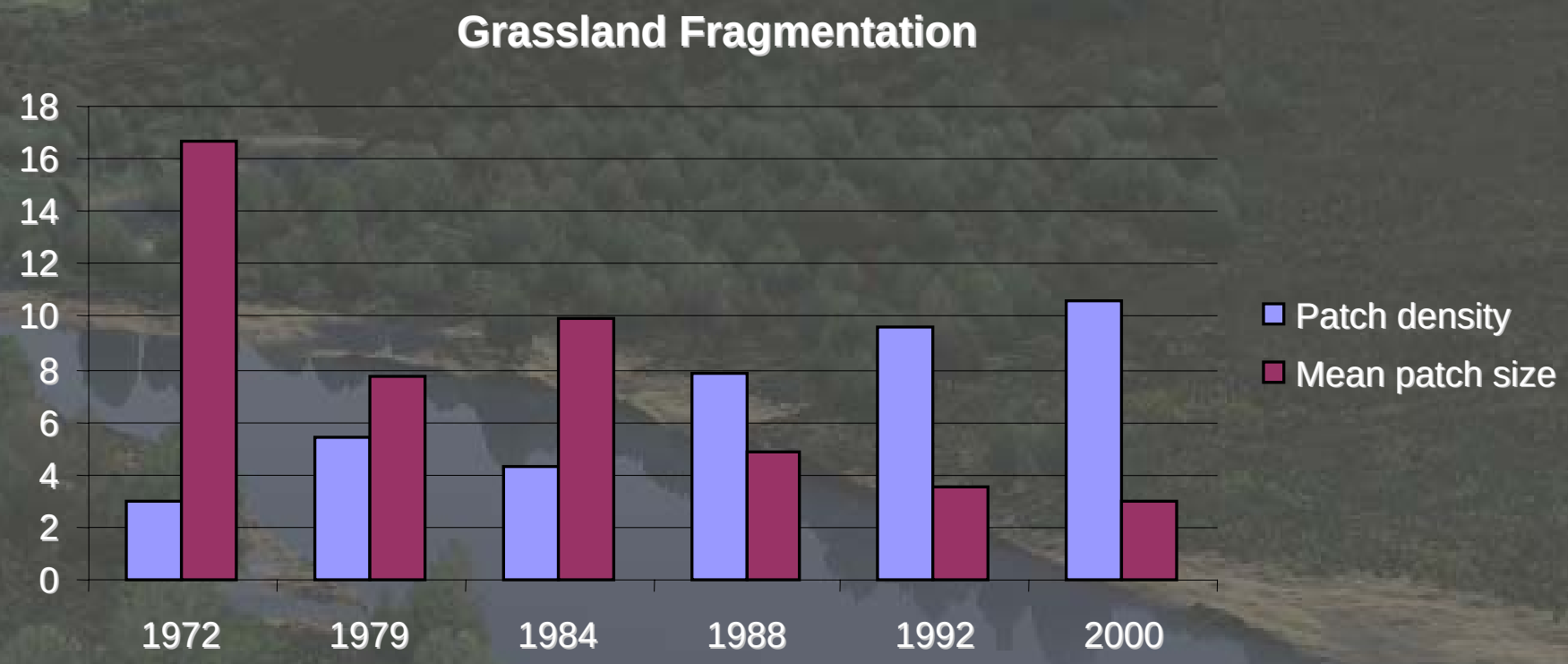


Classes in dataset

- Grassland and Cropland
  - SW MO has seen a decline of agriculture
  - Cropland is often hay oriented, which could be misclassified as grassland
  - Pasture/grazing land falls under cropland classification
  - Grassland are areas considered undisturbed by other practices
  - Proper identification requires consideration of seasonality of dataset
- Bare class
  - Primarily represents quarries
  - In ’72 and ’79, quarries classified as urban, although the bare class existed
  - In 1984, quarries classified as bare
  - In 1988, the bare class was omitted from the classification
  - In ’92 and ’00, the bare class returned, but the quarries continued to be classified as urban
- Water class
  - Discrepancy between polygon representation and vector representation
  - Only Springfield Lake and James River represented, by polygons
- Urban, as discussed by Chris
- Forest, as discussed by Nathan

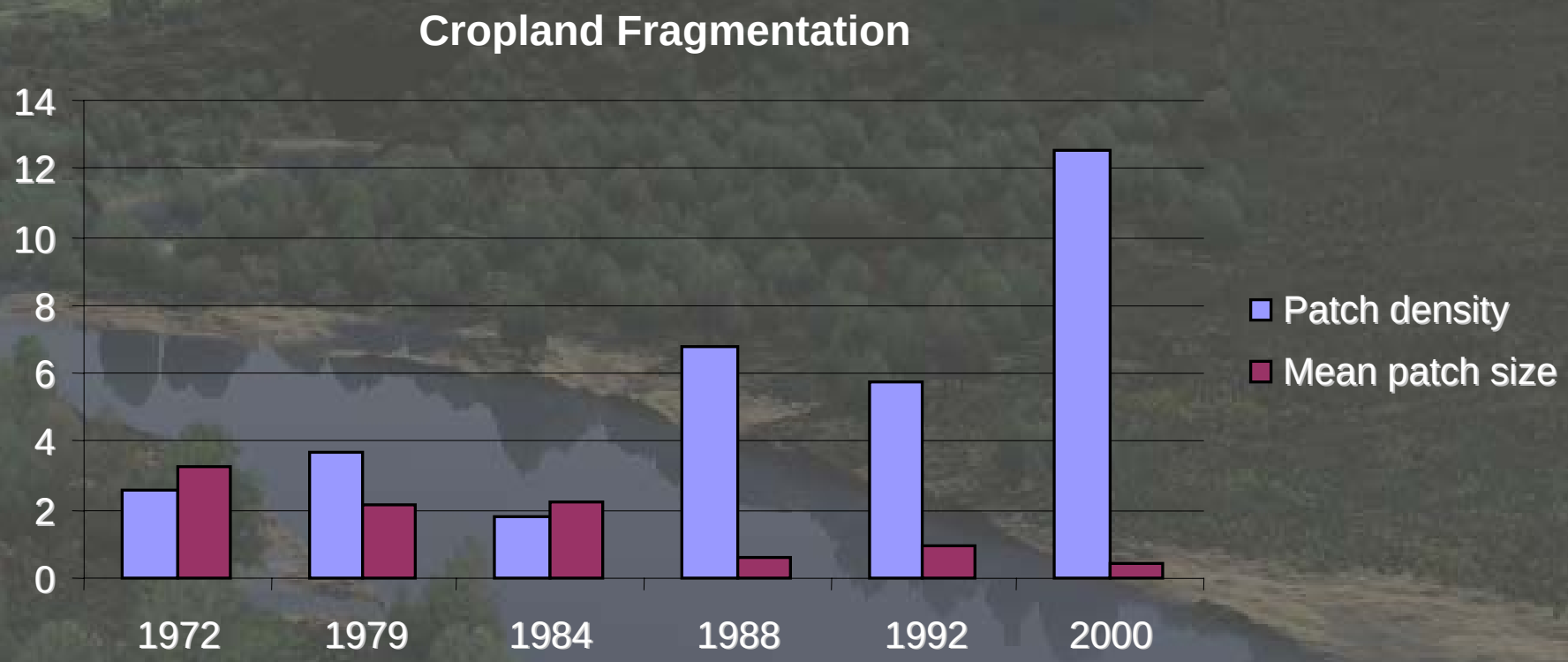

Percentage Classification at Selected Years
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
Percentage Distribution
1972
1979
1984
1988
1992
2000
Selected Year
Water
Forest
Urban
Grassland
Cropland
Bare

Changes in the Grassland Landscape



Data Courtesy of MoRAP

Changes in the Cropland Landscape



Data Courtesy of MoRAP

Urban Sprawl Land Use Change

1972

2000

Conclusions

- Increased urbanization pressures
  - Other land cover has to yield
  - Witnessing large tracts of farmland (grazing/crops) being dissected into impervious tracts for urban expansion
- Fragmentation of Grassland and Cropland
  - Smaller area patches, more total number of patches
  - Dominance of urban
    - Number of urban patches are increasing, as is size
    - Eventually, urban patches no longer separated by other land use classes
    - Number of urban patches decreases, size of urban patches increase
- Impacts
  - Downstream
    - Sediment loading
    - Urban pollutants
  - Ecological
    - Increased edge effects on species habitat
    - Habitats relocated or destroyed in some cases
    - Species introduction/destruction
- Forecast
  - Urbanization will continue to spread south of Springfield in a buffer area that provides adequate commute time and convenience to Springfield
  - Witness growth in areas toward Clever, Sparta, and Rogersville
  - What will lessen expansion South and force it North at a similar rate? (traffic, taxes, schools)

Project conclusions

- Not only ecological but also anthropogenic processes drive landscape change; these are linked to the public perceptions and attitudes towards the environment (culture)
- Geovisualizations are a generalized representation of the landscape
- Local perception vs. outsiders' perception
- Large scale public outreach through geovisualizations can change that perception
- Geovisualization need to be put into the context of the ecological and anthropogenic processes to be most effective

Acknowledgments

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JRBP James River Basin Partnership

MoRAP