

Development of a Regional Scale Tool to Assess Riparian Integrity in Austin, Texas

Society for Ecological Restoration, Texas Chapter &
Texas Riparian Association

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Outline

- ž Index of Riparian Integrity
- ž City of Austin Riparian Assessments
- ž Building the Model
 - Integrity Indicator
 - Variables
 - Spatial Component
- ž Model Selection
- ž Model Results
- ž Questions

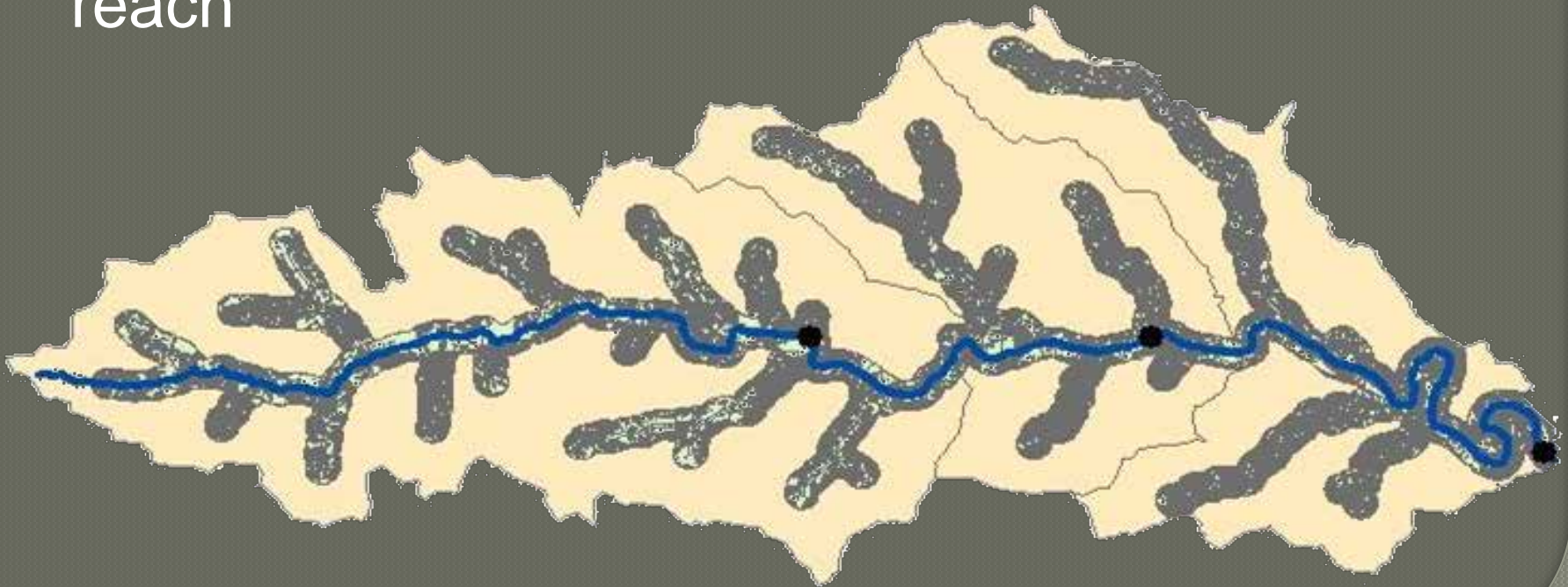
Index of Riparian Integrity (IRI)

Macro-scale model
based on aerial
photography and
land use data to
assess and quantify
the riparian integrity
in Austin, TX



City of Austin Assessment and Prioritization of Riparian Areas

- Assessment includes water quality, sediment stability, and riparian vegetation scores
- Assessment performed at one site for an entire reach



Model

$$y = X\beta + u + \gamma Wu$$

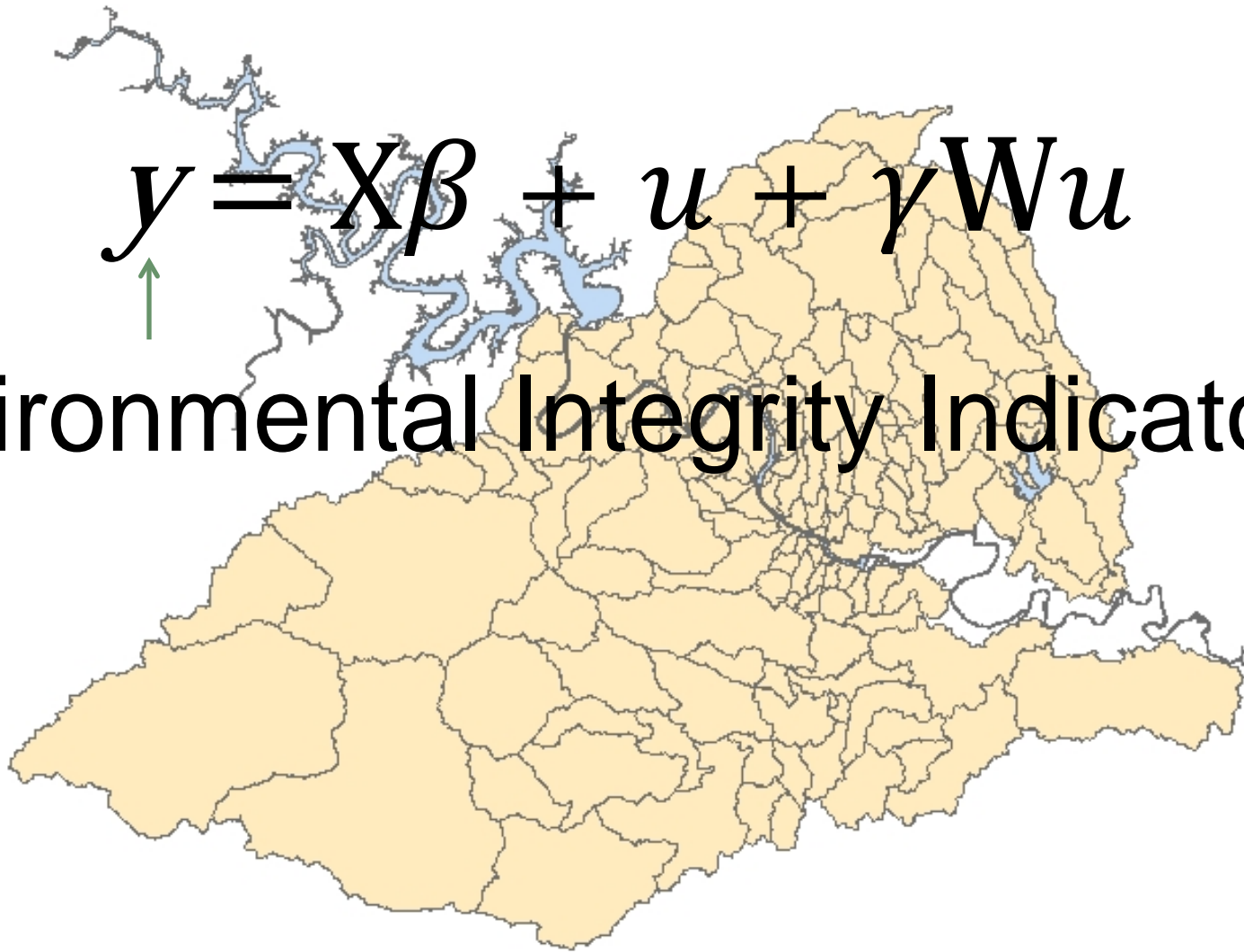
Environmental Integrity Indicator
Explanatory Variables:
Landscape Values
Error
Weighting Matrix

Index

$$y = X\beta + u + \gamma Wu$$



Environmental Integrity Indicator



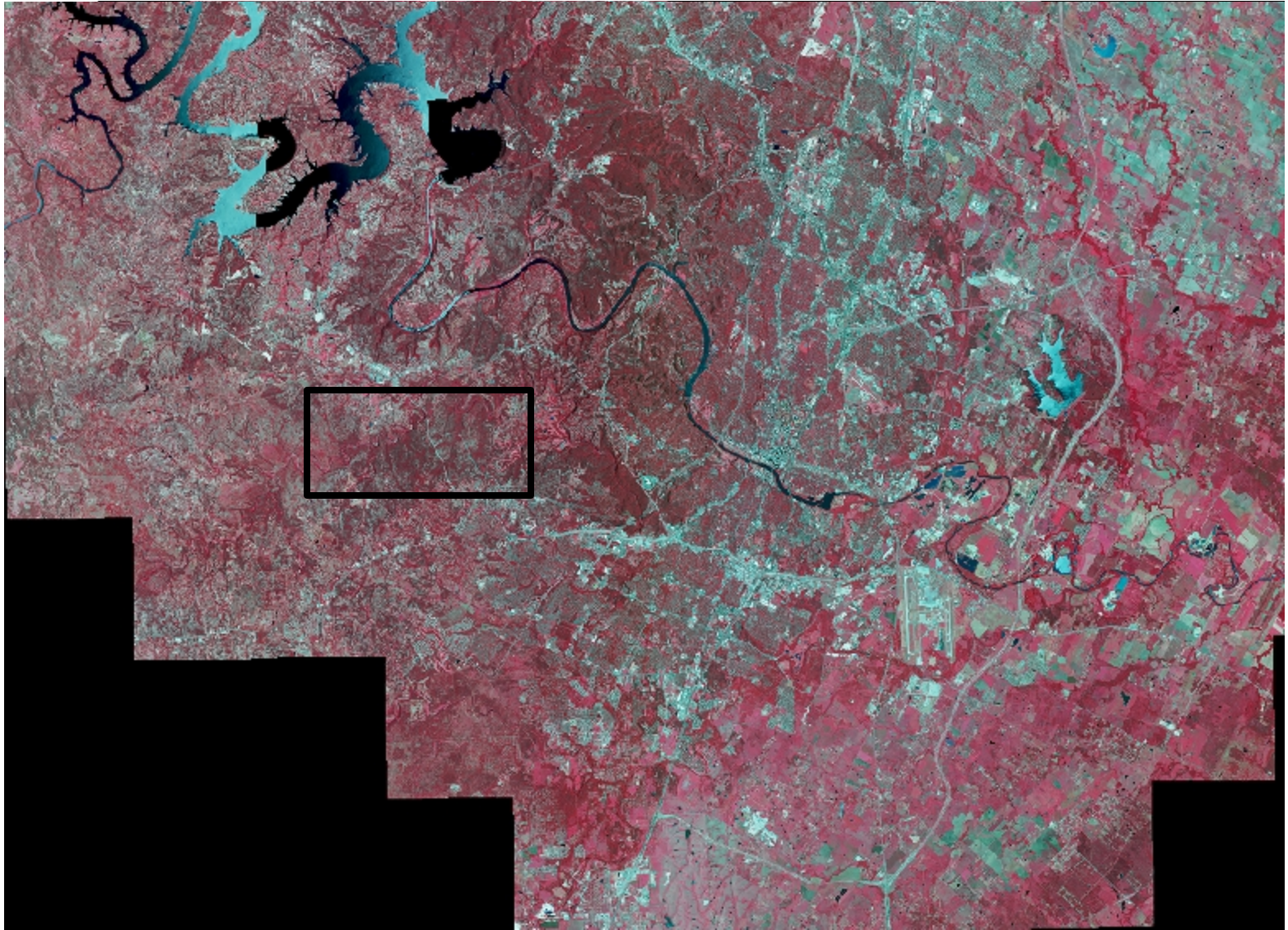
Model

$$y = X\beta + u + \gamma Wu$$

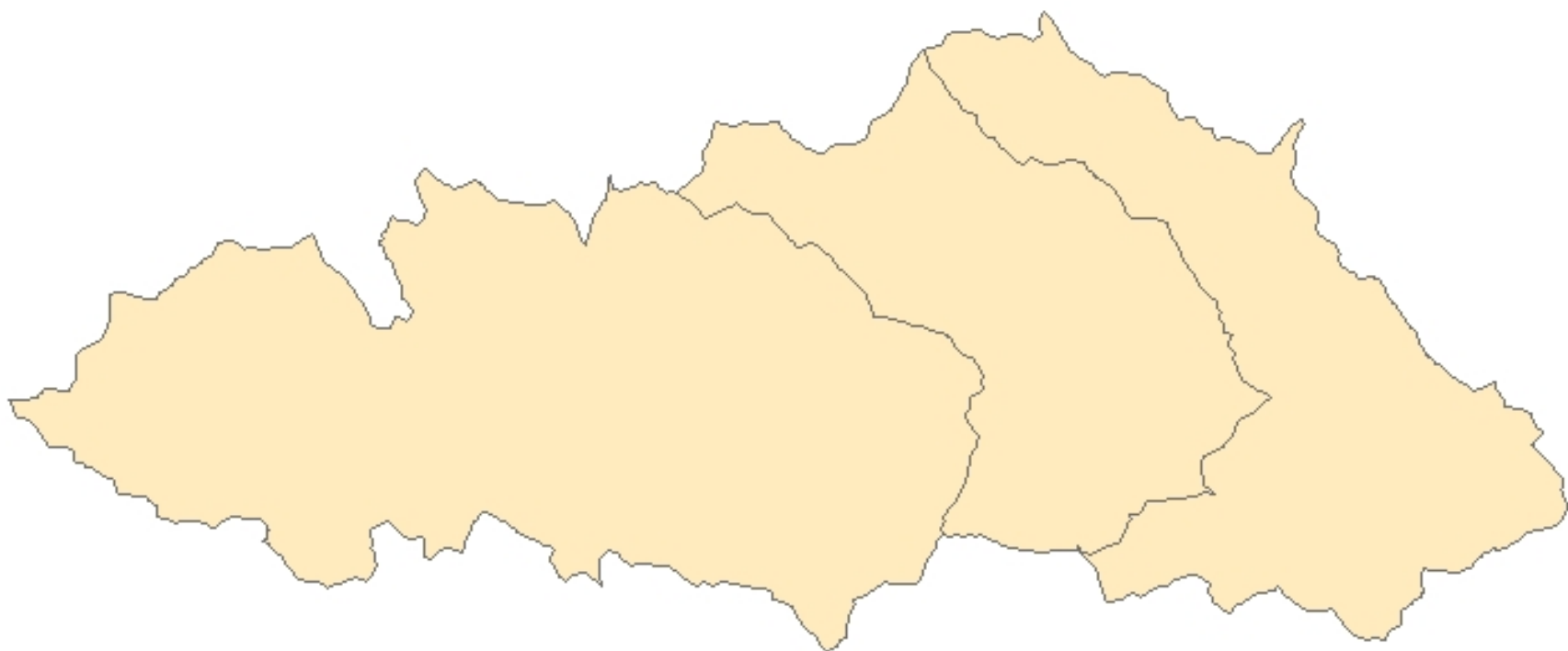
Explanatory Variables:
Landscape Values



Aerial Photography



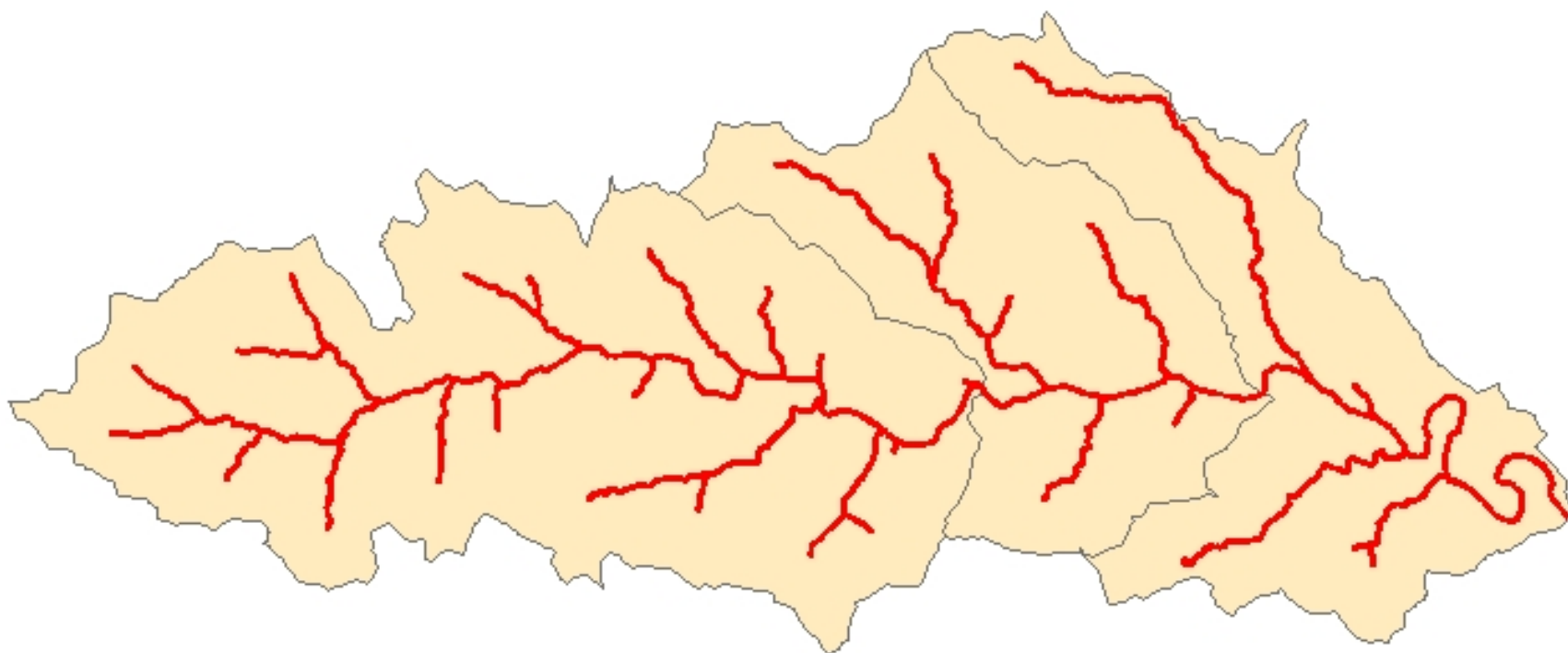
LITTLE BARTON CREEK



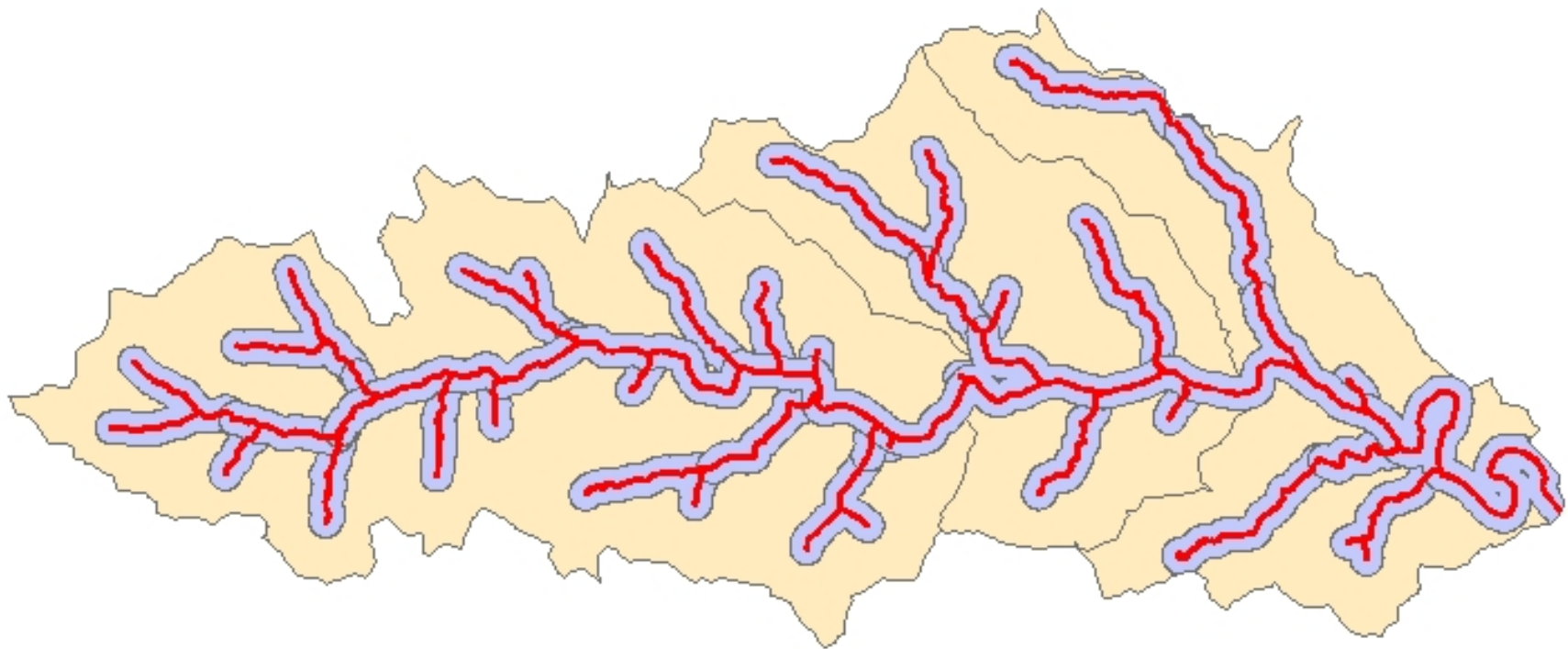
LITTLE BARTON CREEK



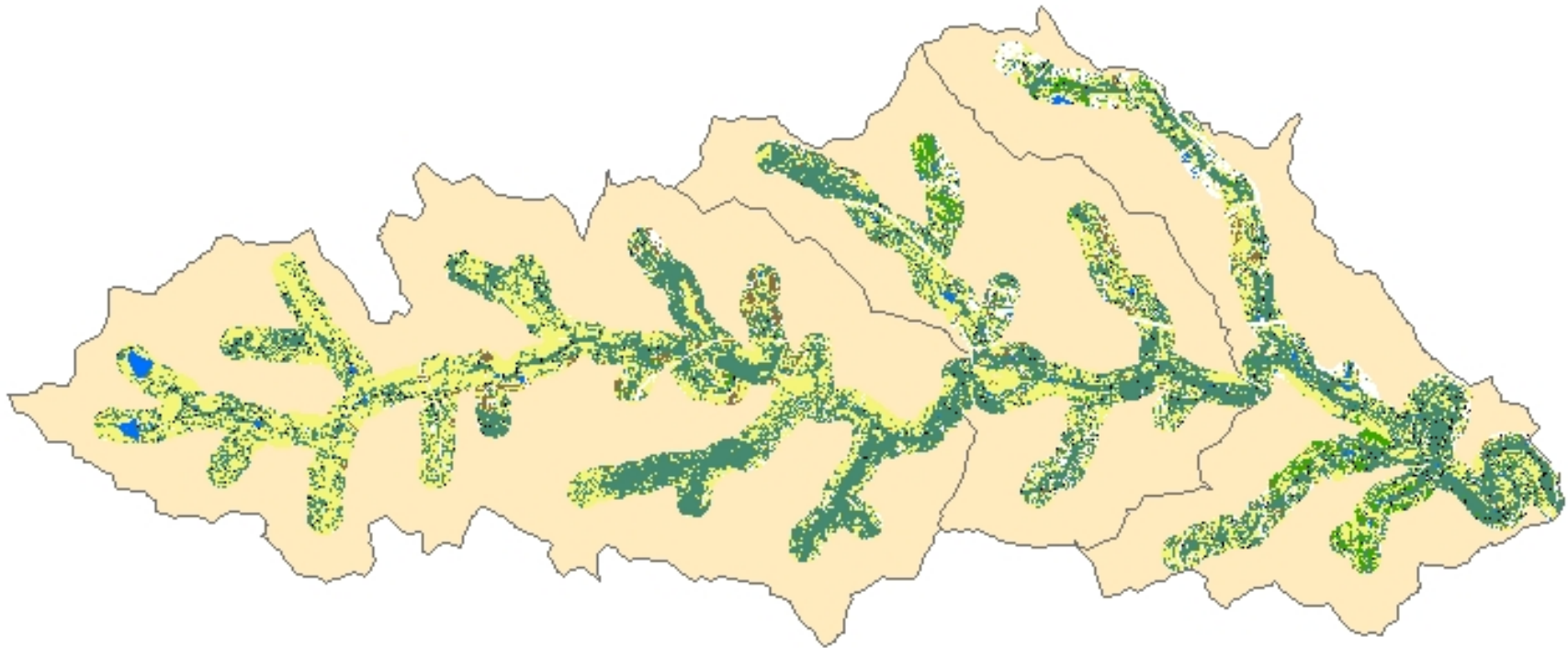
LITTLE BARTON CREEK



LITTLE BARTON CREEK



LITTLE BARTON CREEK



Robust Vegetation



Water



Woody Vegetation



Sparse Vegetation

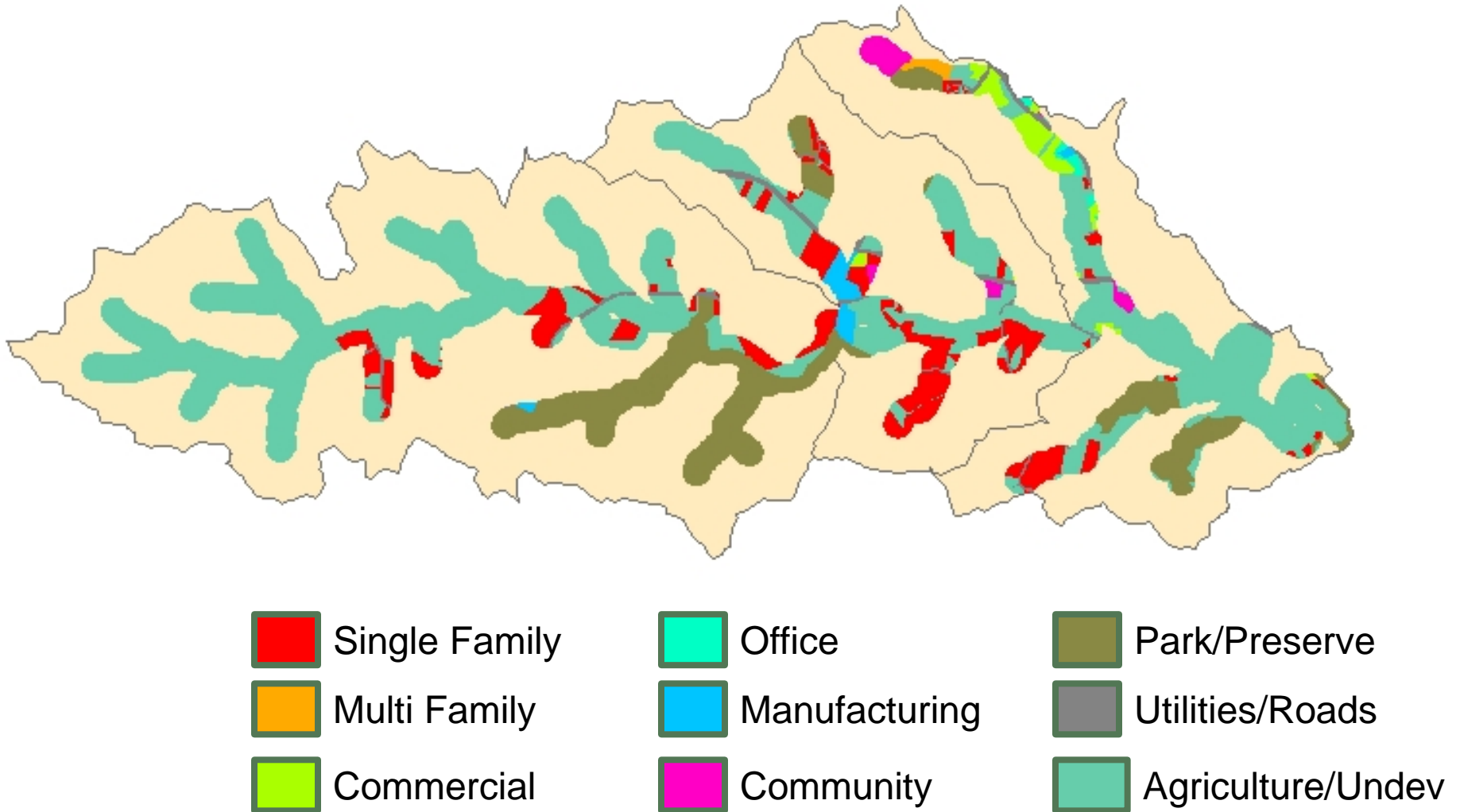


Shadow

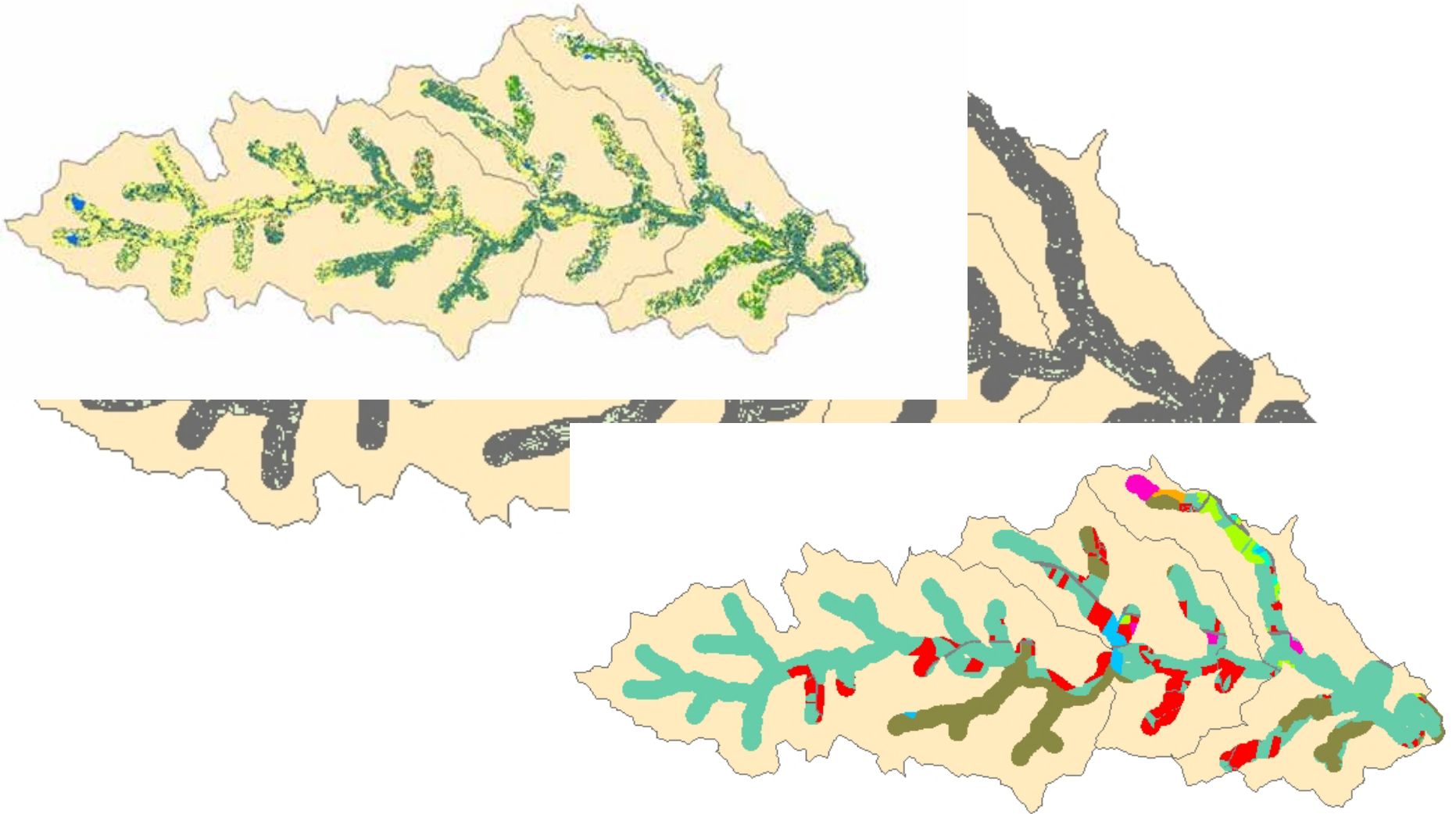


Impervious Cover

LITTLE BARTON CREEK



LITTLE BARTON CREEK



LITTLE BARTON CREEK



Model

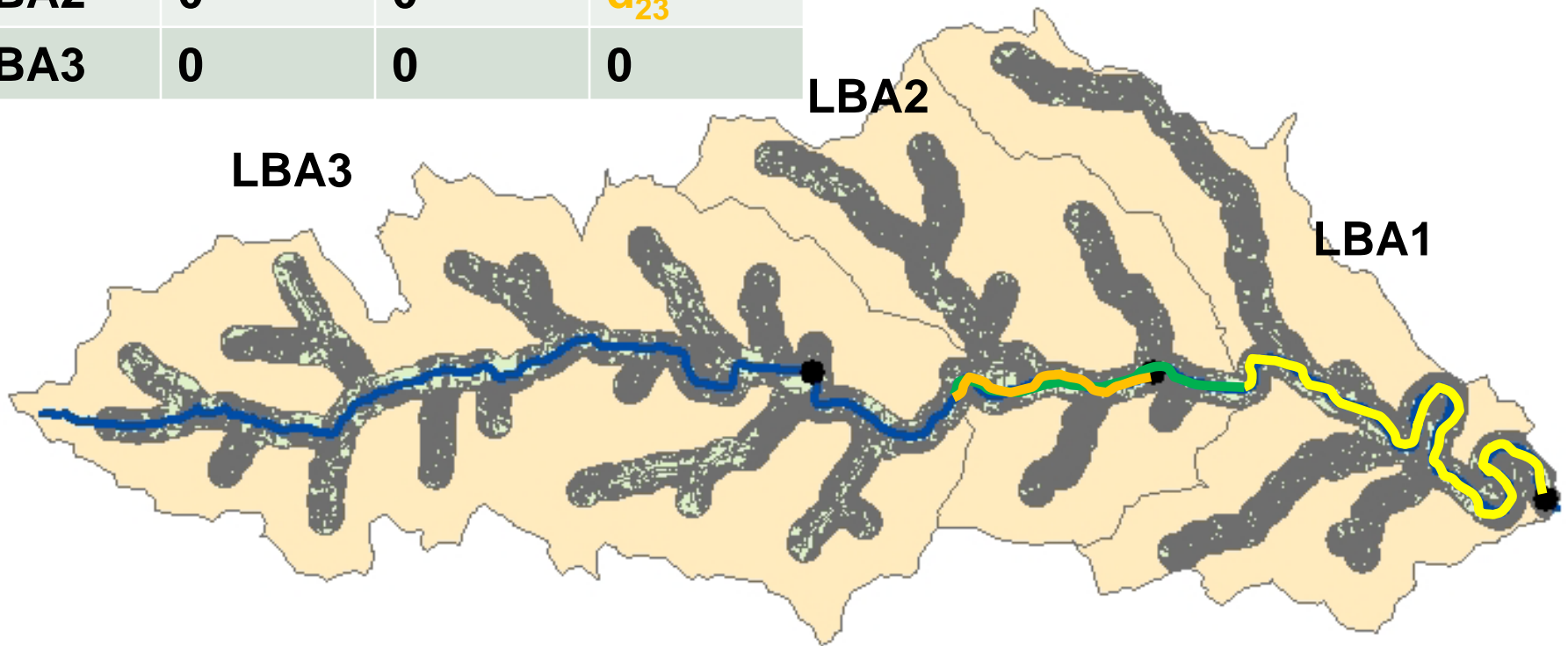
$$y = X\beta + u + \gamma Wu$$

Weighting Matrix



LITTLE BARTON CREEK

	LBA1	LBA2	LBA3
LBA1	0	d_{12}^{-1}	d_{13}^{-1}
LBA2	0	0	d_{23}^{-1}
LBA3	0	0	0



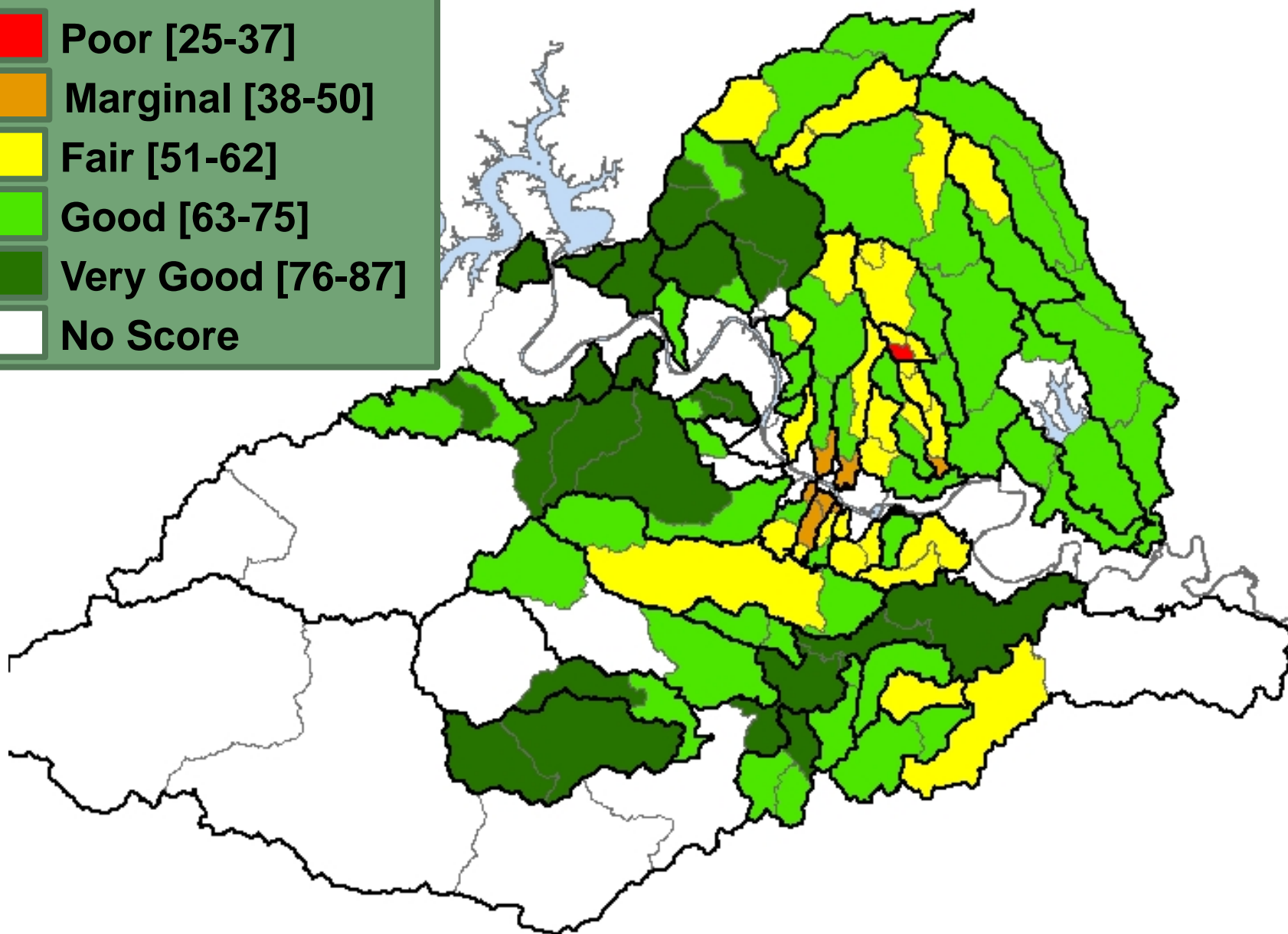
Model Selection

- ž Single variable of most significance was Woody Vegetation in the 50ft buffer in small drainage areas (64-320 acres).
- ž General Linear Models were compared via BIC, Adjusted R^2
- ž Multicollinearity and model diagnostics were compared for top models

Model Parameters

50 ft. Buffer			400 ft. Buffer		
Small	Medium	Large	Small	Medium	Large
Impervious Cover	Sparse Vegetation	Single Family Residential	Robust Vegetation	Woody Vegetation	Residential: Duplex
Sparse Vegetation			Roads		
Woody Vegetation					
Apartments					
Single Family Residential					

*Small = 64-320acres, Medium = 320-640acres, Large = >640acres



Poor [25-37] Buttermilk Creek



Fair [51-62] Williamson Creek



Good [63-75] Shoal Creek



Very Good [76-87]

Onion Creek



Very Good [76-87]

Bee Creek



Acknowledgements

- ž Mateo Scoggins and Surface Water Team
 - City of Austin, Environmental Resource Mgmt.
- ž Jon Meade and Kathryn Murray
 - City of Austin, Policy and Planning

Questions?

