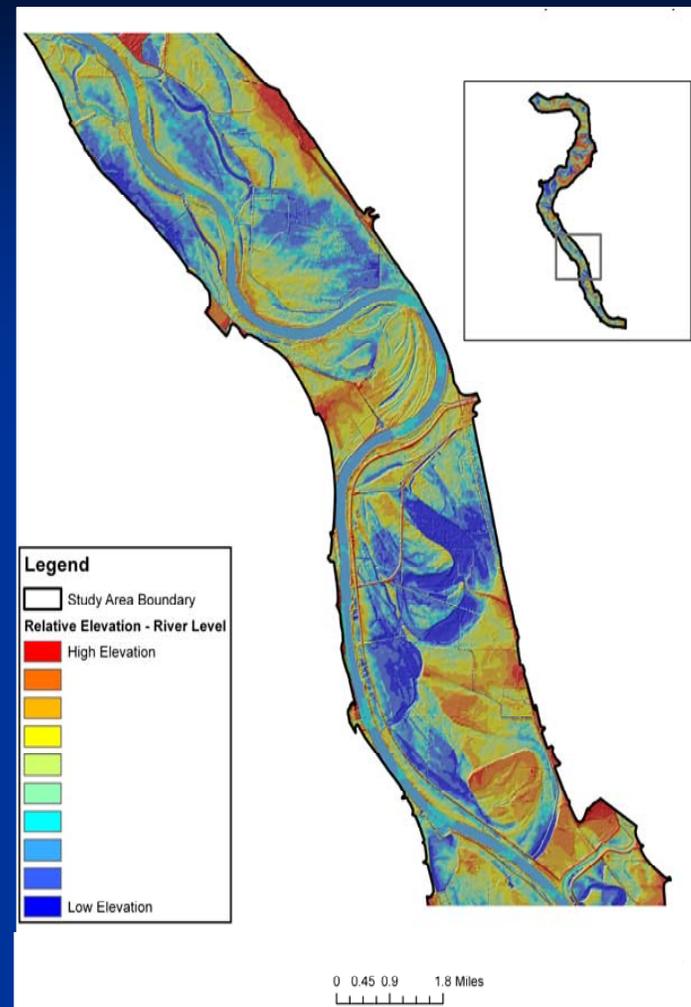
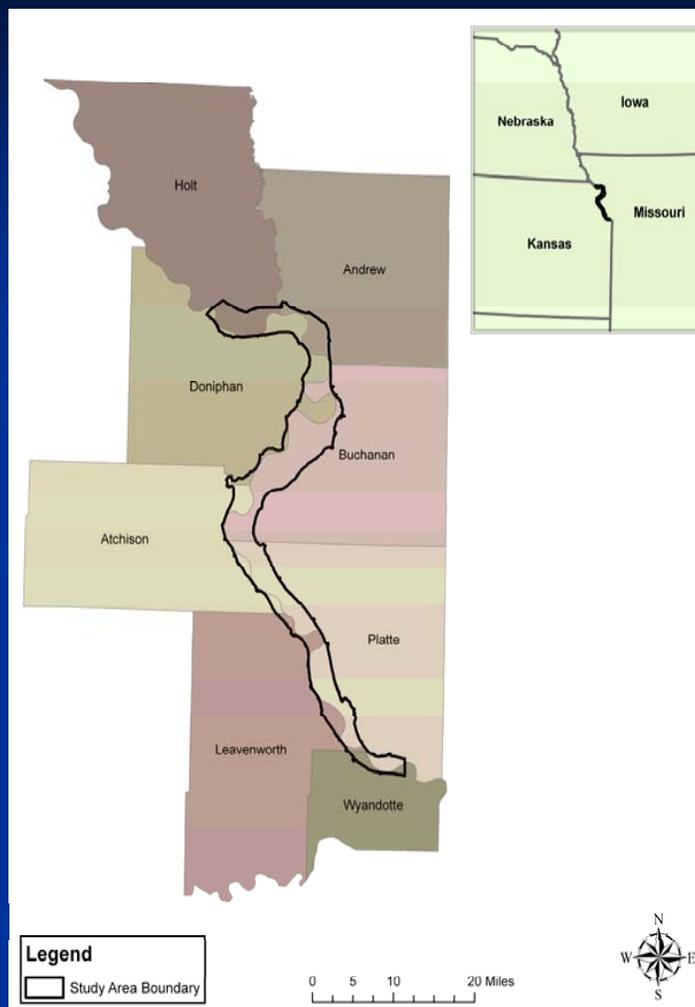


Missouri River Floodplain Modeling



Presented by:
Ronnie Lea
GIS Analyst
MoRAP



Objectives

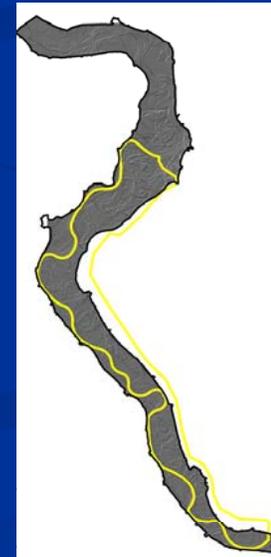
- Develop information relevant to bird conservation and management
 - Identification of potential wetland restoration areas
 - Identify distribution of tract boundaries and land use/land cover

Study Area

- Missouri River Floodplain – St. Joseph, MO to Kansas City, MO
 - Missouri River mile 476 to 378
 - St. Joseph/Kansas City River Corridor IBA



Study Area



IBA

Datasets

■ Acquired

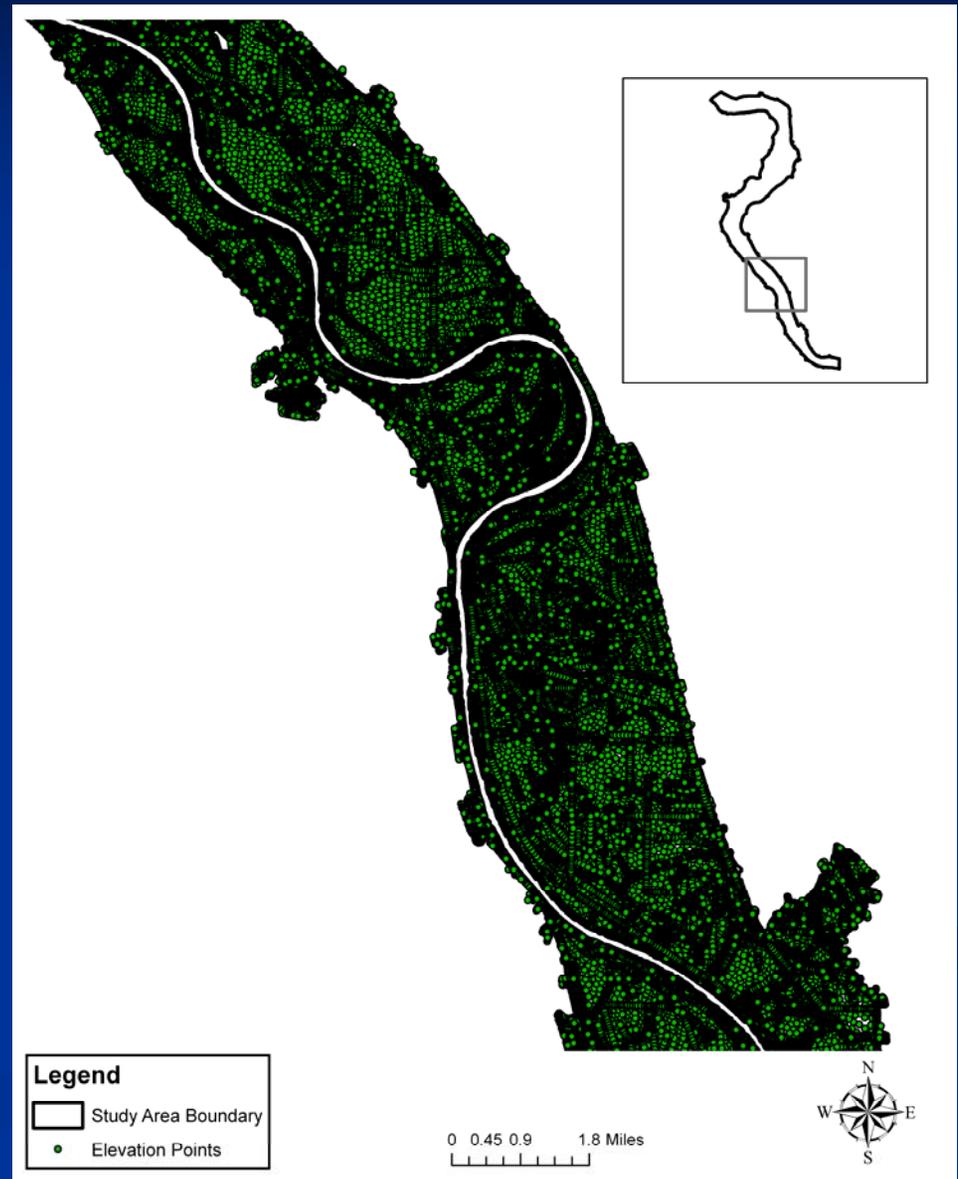
- Elevation Data - USACE
- Flood Stage Data – USACE
- NRCS SSURGO Soils
 - Soil Hydrologic Group
 - Soil Drainage Class
- Public Lands
- NRCS CLU
- 2005 MoRAP LULC
- MoRAP Abiotic Habitat Site Types

■ Created

- DEM
- Relative Elevation
- Distance Grids
 - Public Lands
 - Urban Areas
 - Natural Vegetation
 - Landscape Context
- Solar Insolation
- Potential Restoration Areas

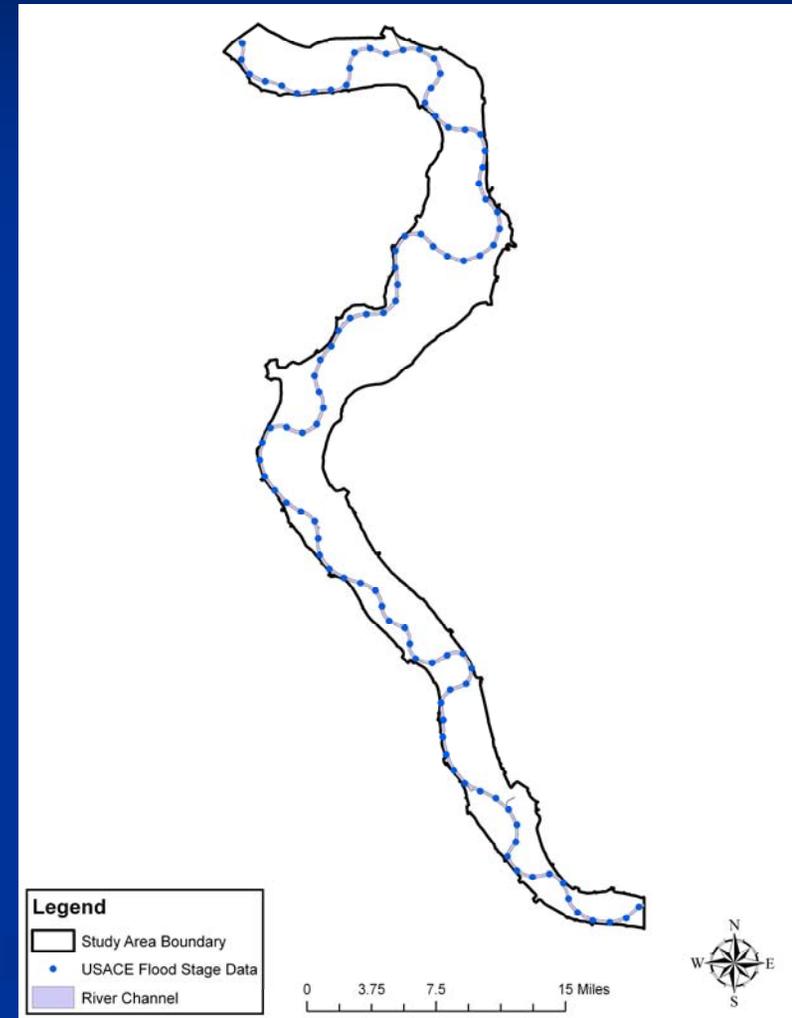
Datasets - Elevation

- Break lines and mass points
 - Over 1.2 million points
- 25 foot posting
- 1998 for USACE by Horizon, INC.



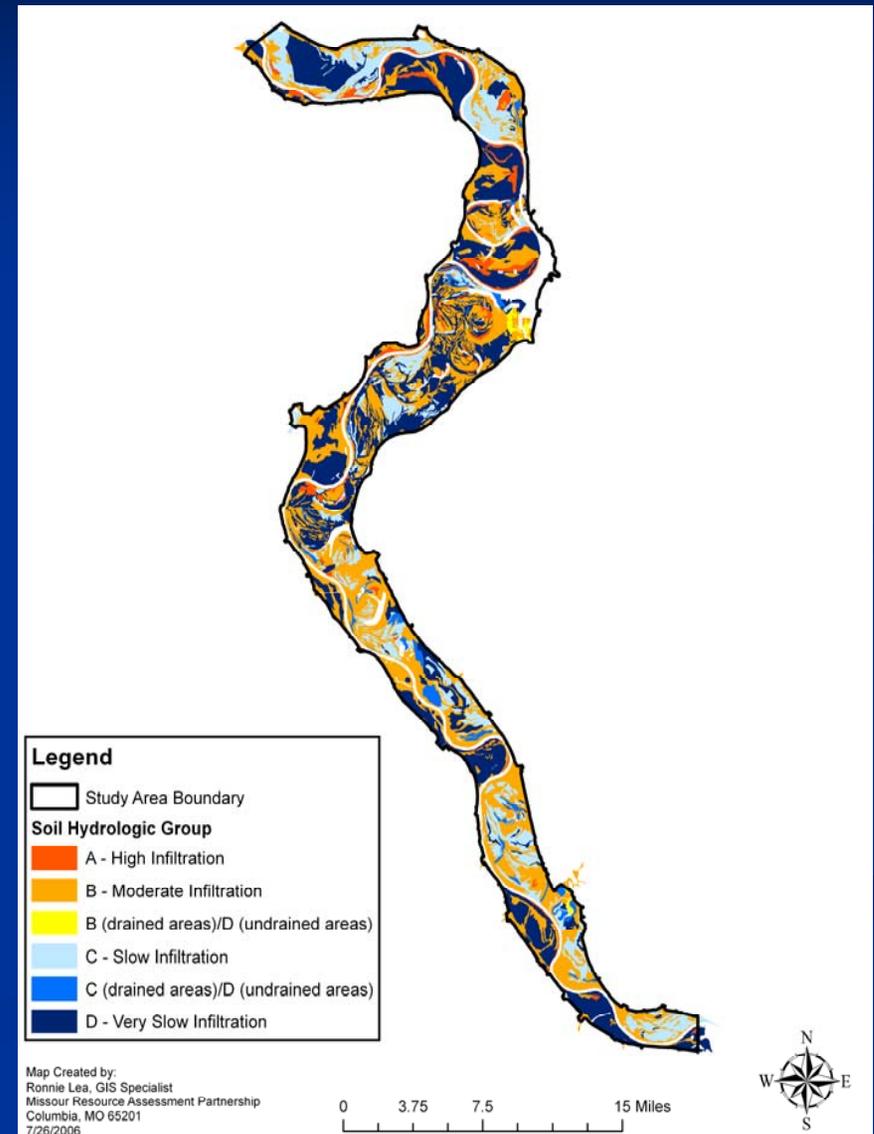
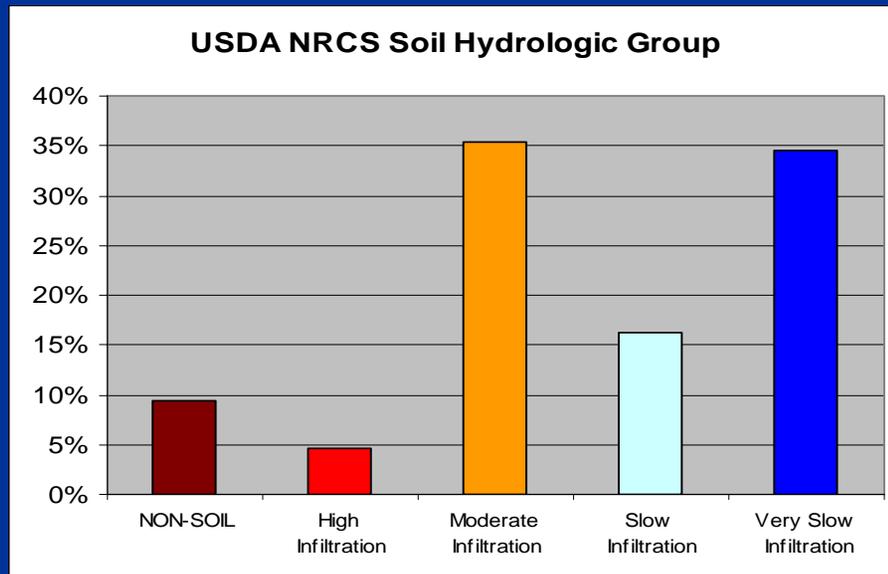
Datasets – Flood Stage Data

- USACE
- 1999 from hydrologic models
- 2, 5, 10, 20, 50, 100, 200, 500 year flood elevations



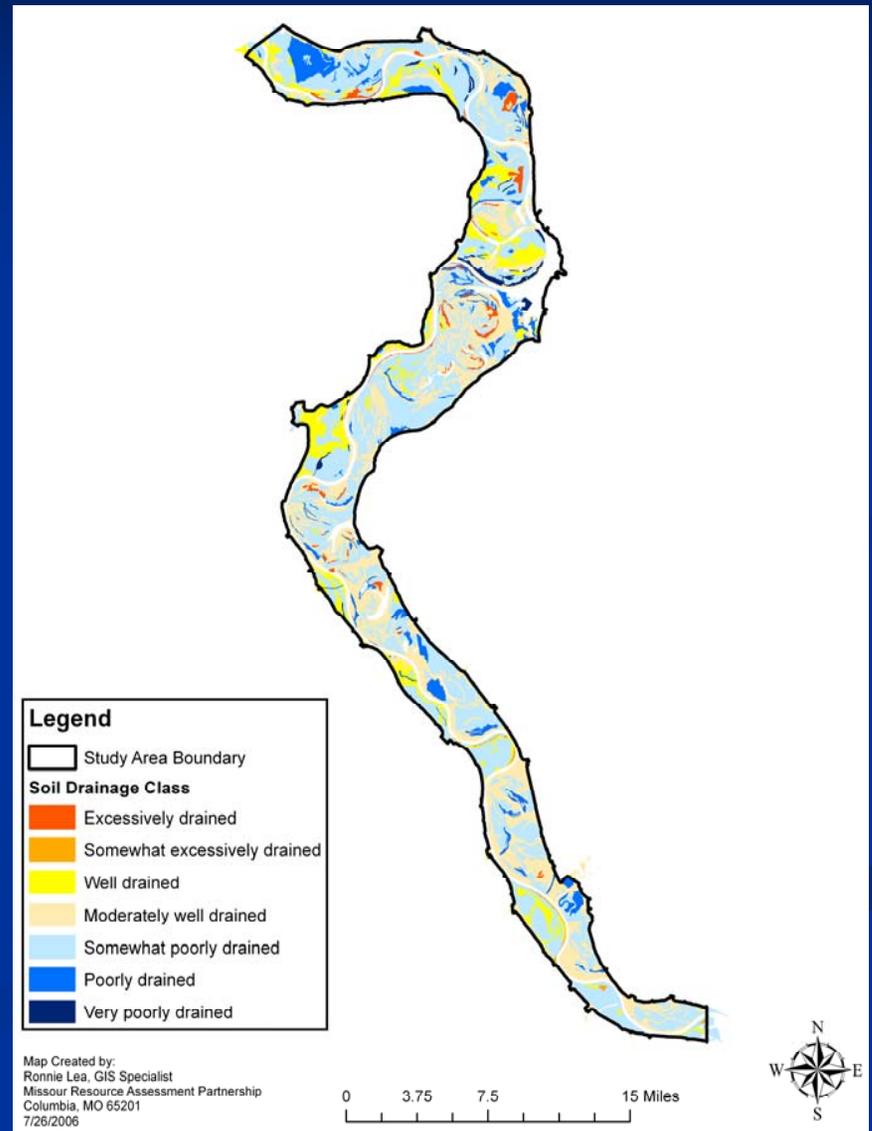
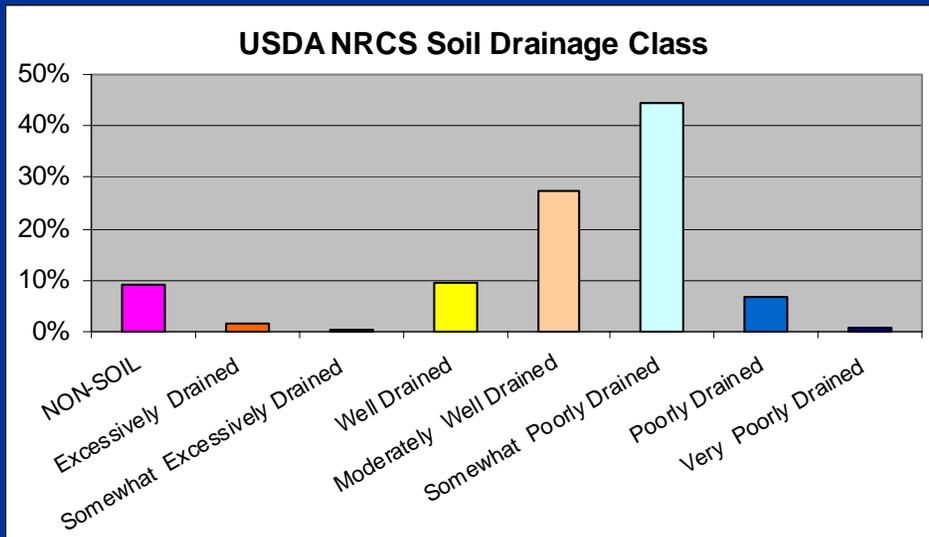
Datasets – NRCS SSURGO Soils

- Soil Hydrologic Group
- 4 groups



Datasets – NRCS SSURGO Soils

- Soil Drainage Class
- 7 classes



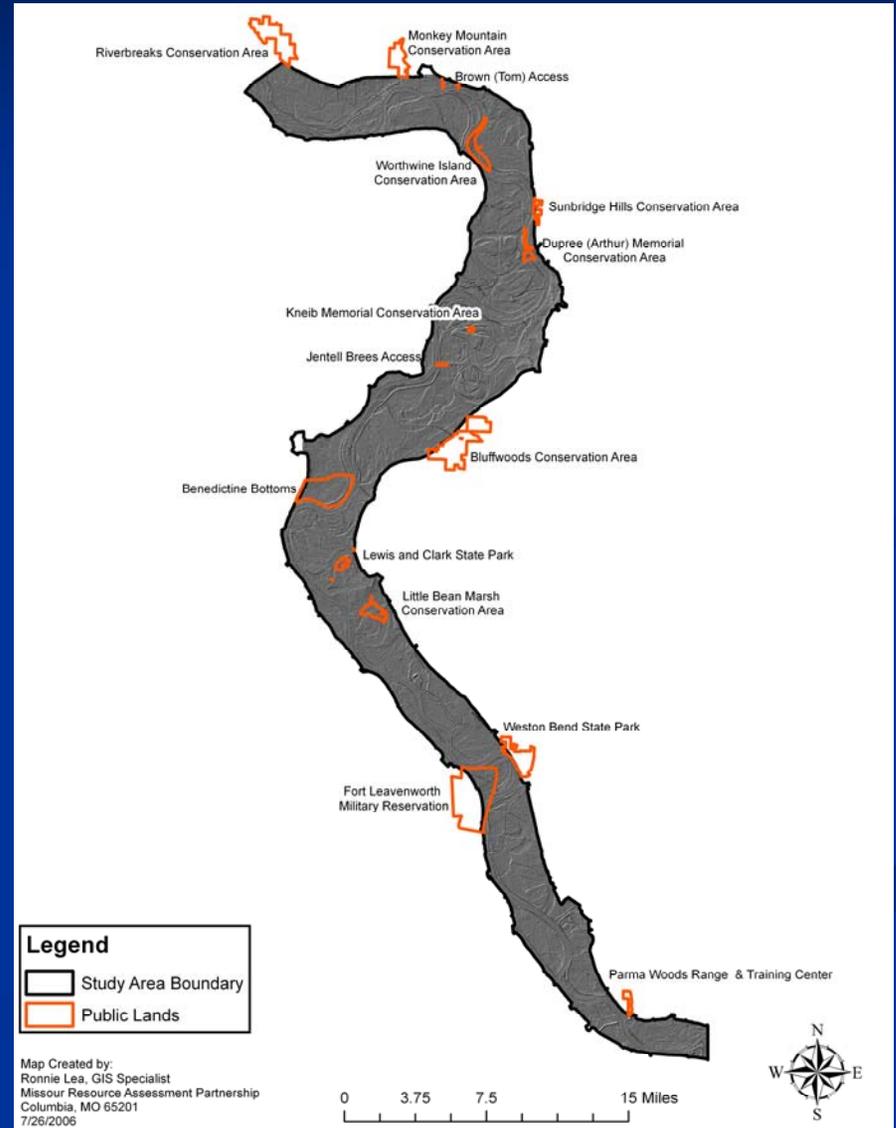
Datasets – Public Lands

- MoRAP Public Lands
- Kansas PAD

Public Lands within Study Area	
ha	2105.4
% Study Area	3.4%

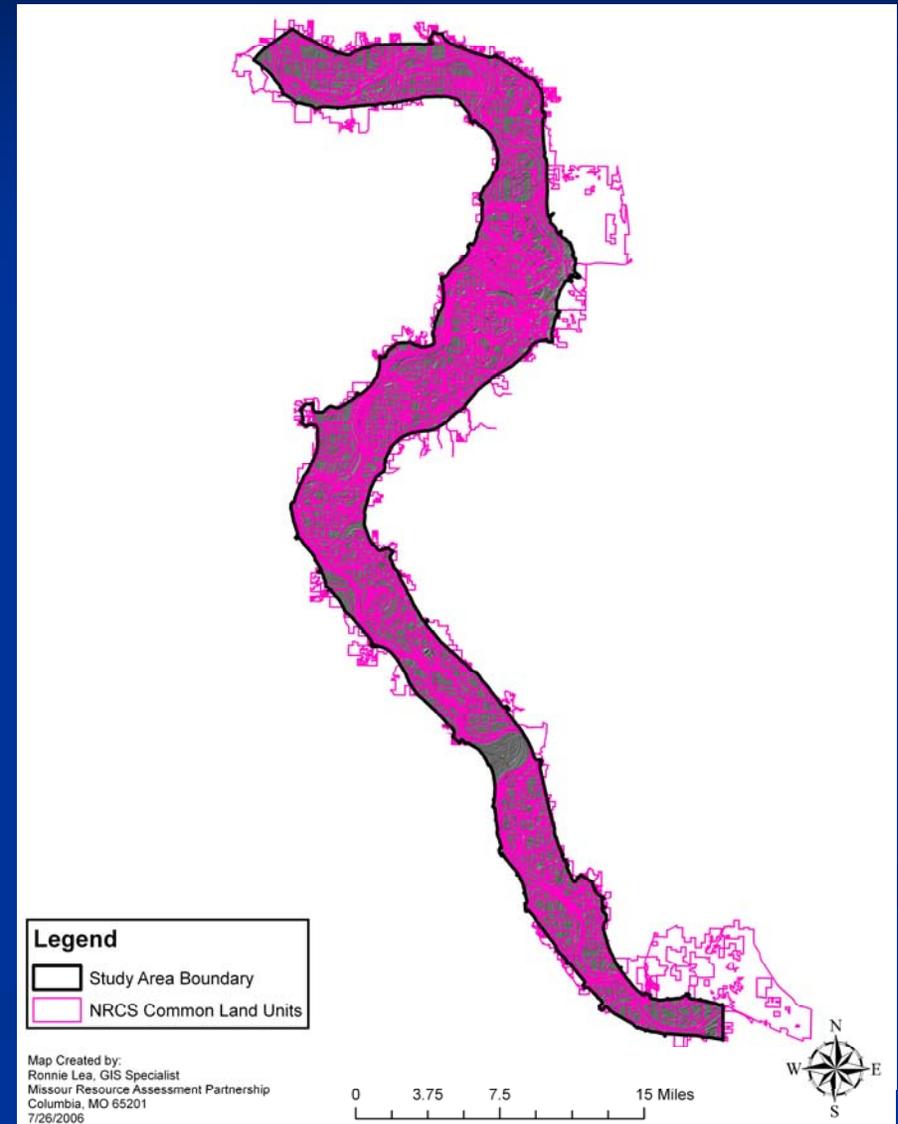
5 Largest Public Lands

Public Area Name	Area within Study Area (ha)	Full size of Public Area (ha)
Dupree (Arthur) Memorial Conservation Area	86.9	86.9
Little Bean Marsh Conservation Area	177.9	177.9
Worthwine Island Conservation Area	257.2	257.2
Fort Leavenworth	569.0	1573.6
Benedictine Bottoms	866.8	895.7



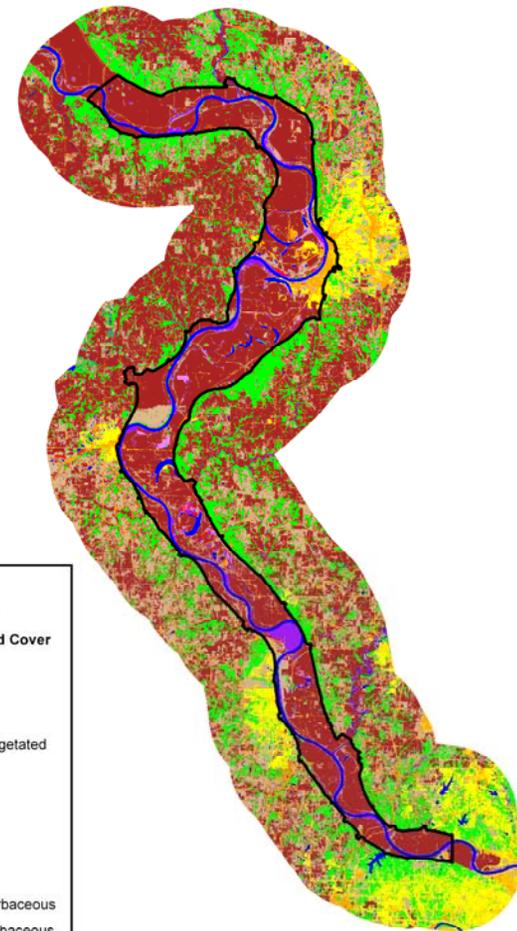
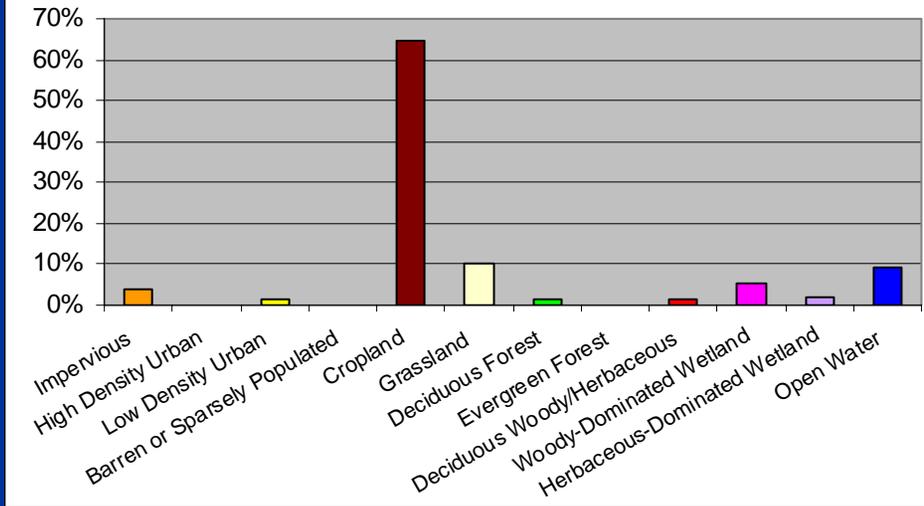
Datasets – NRCS CLU

- Common Land Units
- Tract/field boundaries



Datasets – 2005 MoRAP LULC

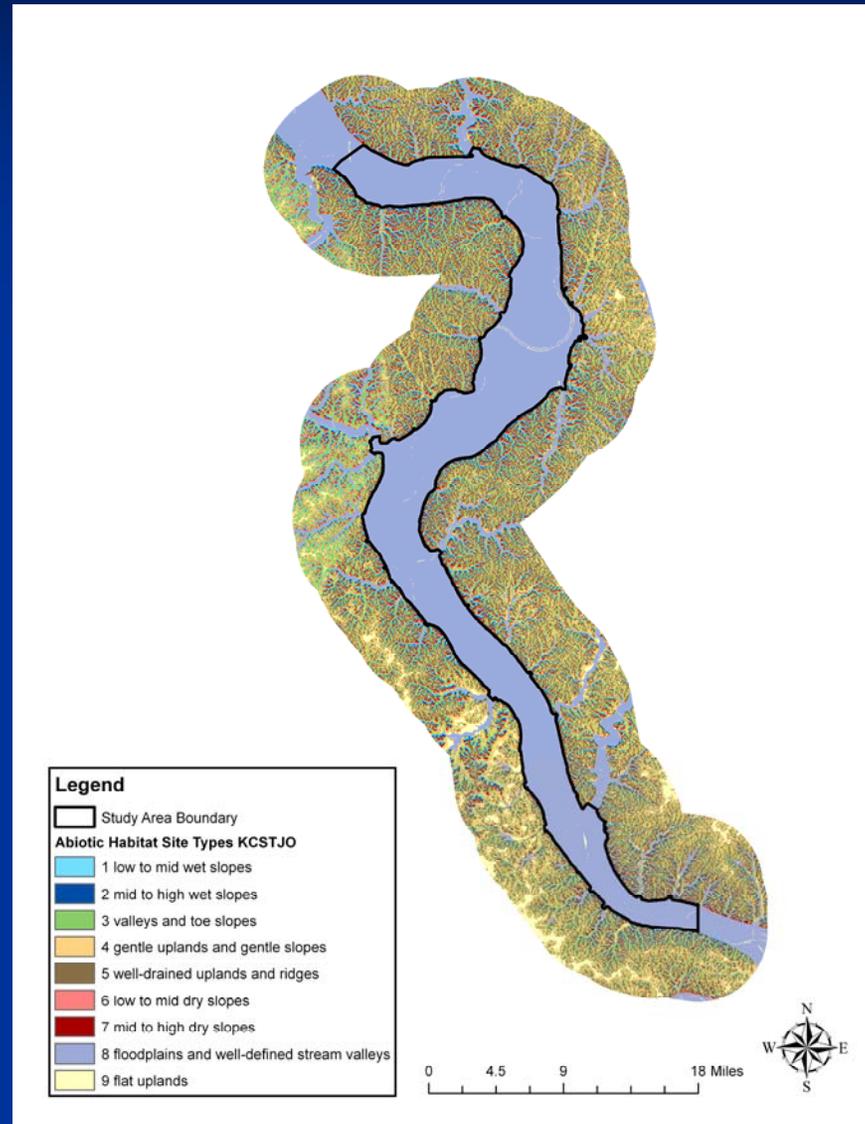
2005 MoRAP LULC Study Area Distribution



0 4.5 9 18 Miles

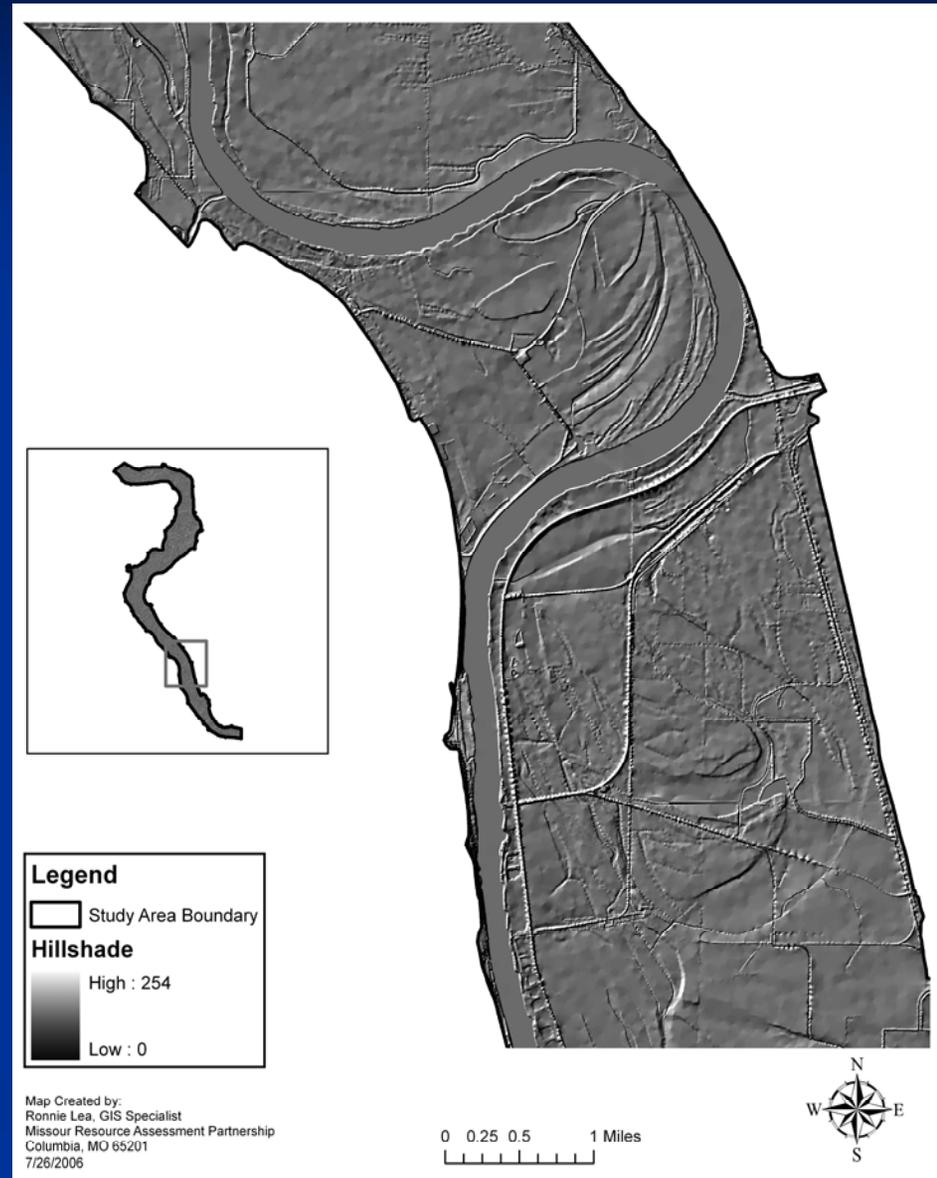


Datasets – Abiotic Habitat Site Types



Products - DEM

- 5 m pixel size
- Less than 1 foot vertical resolution

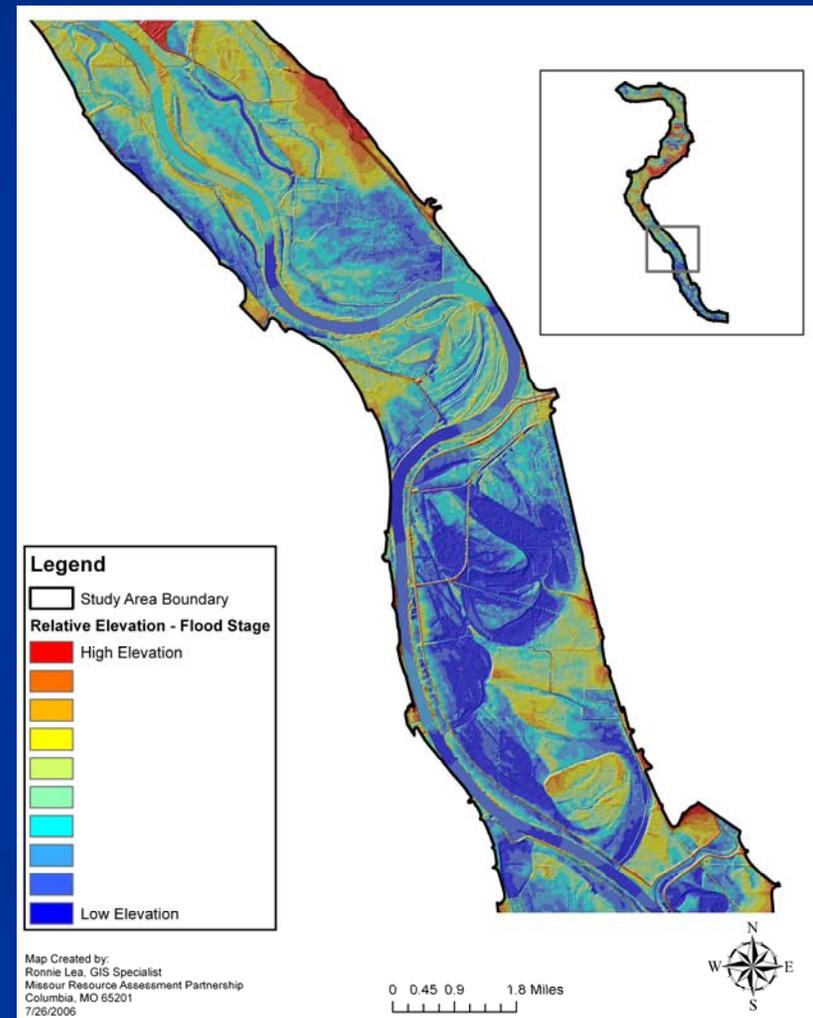
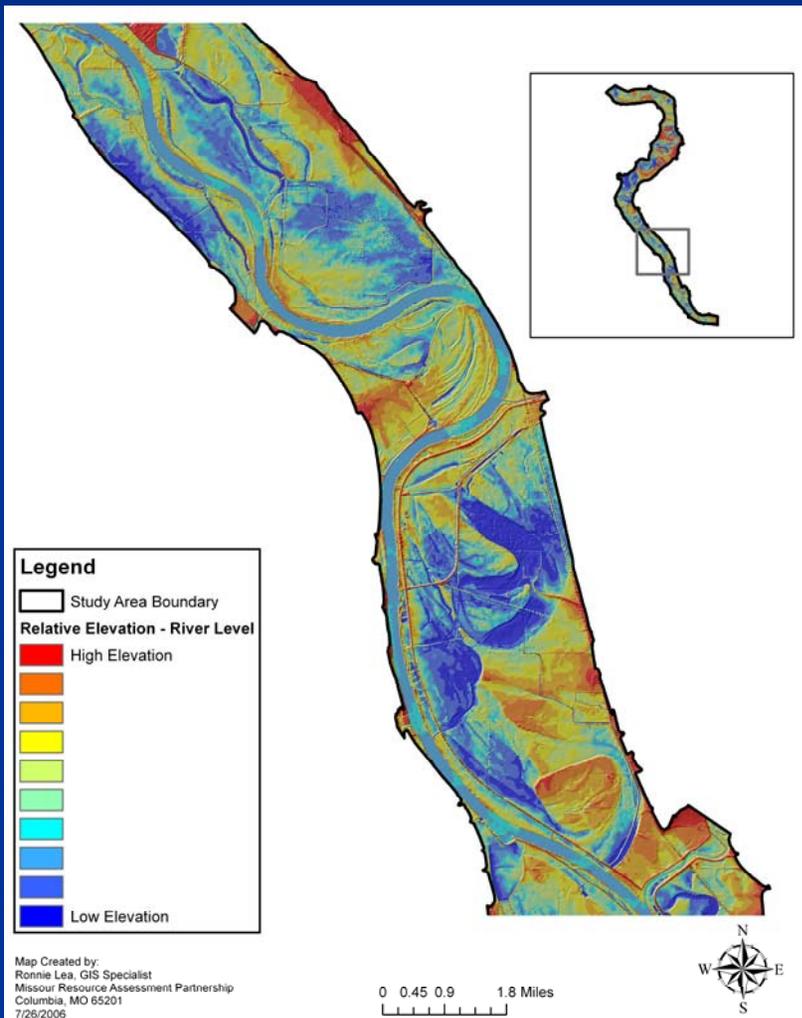


Products – Relative Elevation

- Two different approaches

River Level

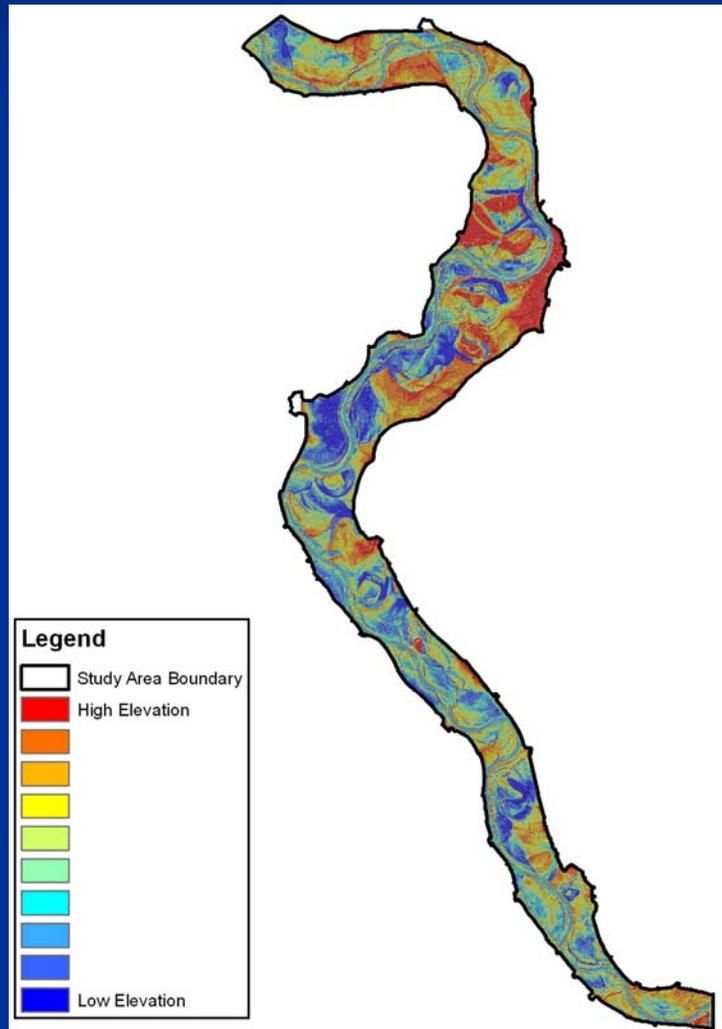
Flood Stage



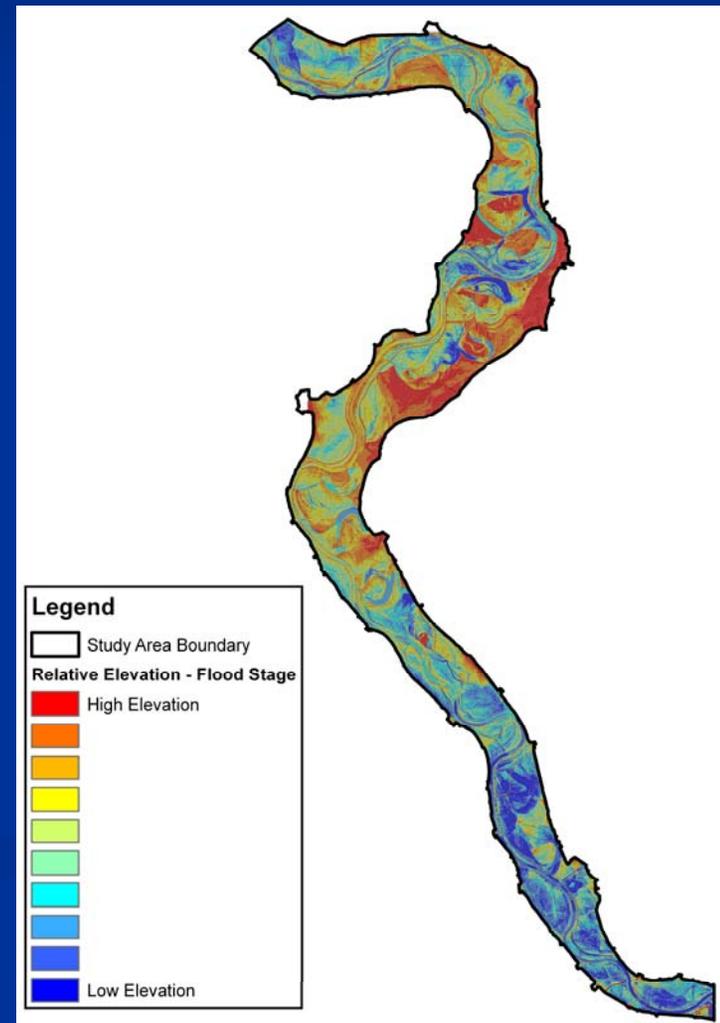
Products – Relative Elevation

- Two different approaches

River Level



Flood Stage



Products – Relative Elevation

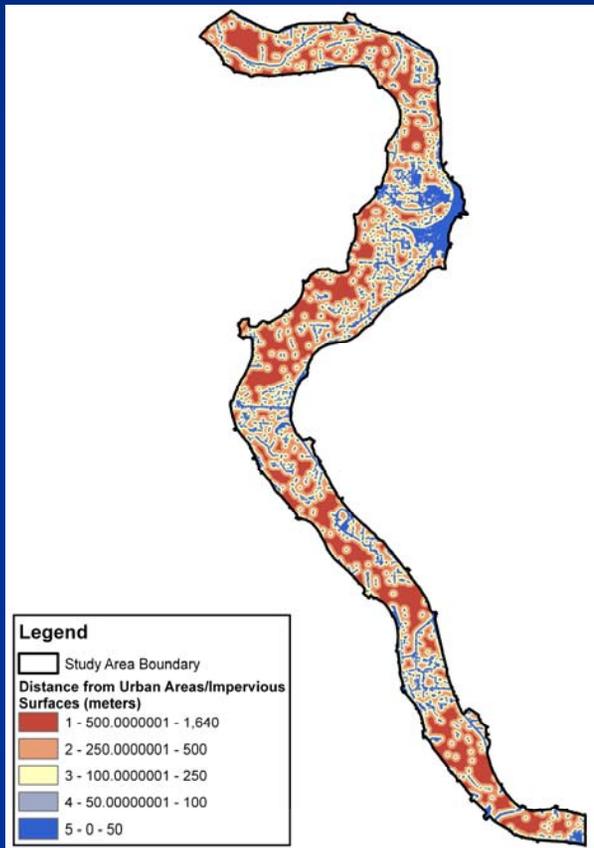
■ Two different results

Relative Elevation - River Level									
County	High ha	High % County	Med_High ha	Med_High % County	Med_Low ha	Med_Low % County	Low ha	Low % County	Sum
Holt	1088.9	22.3%	1532.9	31.4%	1334.8	27.3%	926.1	19.0%	4882.7
Andrew	847.7	24.2%	1234.1	35.3%	915.8	26.2%	499.0	14.3%	3496.6
Buchanan	6159.8	35.2%	3392.0	19.4%	3096.1	17.7%	4839.1	27.7%	17487.0
Platte	2527.6	15.9%	4250.2	26.7%	4786.4	30.1%	4360.2	27.4%	15924.5
Wyandotte	313.1	23.7%	420.7	31.9%	381.9	29.0%	202.7	15.4%	1318.4
Atchison	238.1	6.6%	473.9	13.2%	1002.1	28.0%	1869.8	52.2%	3584.0
Leavenworth	409.0	10.4%	1133.2	28.8%	1665.1	42.3%	728.8	18.5%	3936.1
Doniphan	3038.6	30.2%	2738.7	27.2%	2653.9	26.4%	1624.0	16.2%	10055.1

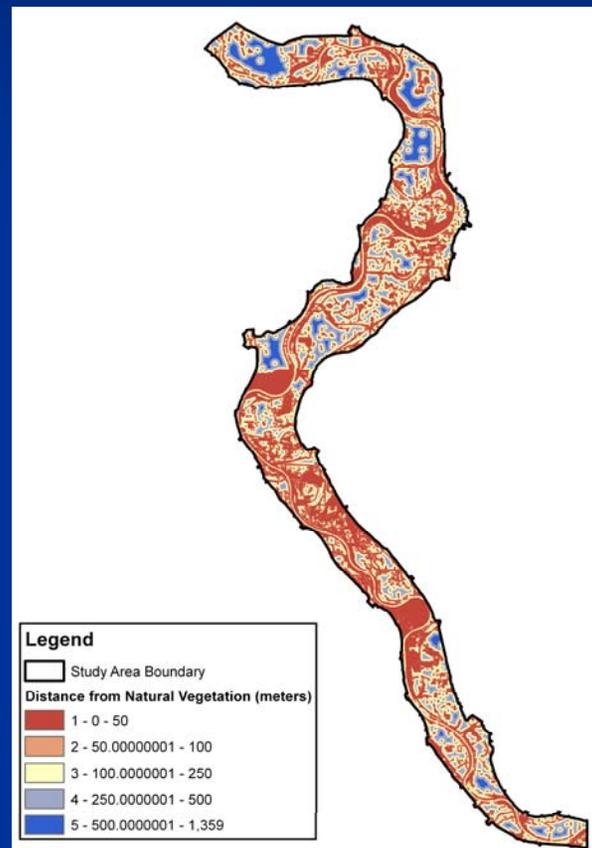
Relative Elevation - Flood Stage									
County	High ha	High % County	Med_High ha	Med_High % County	Med_Low ha	Med_Low % County	Low ha	Low % County	Sum
Holt	479.2	9.8%	1157.1	23.7%	1764.9	36.1%	1481.5	30.3%	4882.7
Andrew	712.3	20.4%	1090.9	31.2%	1084.5	31.0%	608.9	17.4%	3496.6
Buchanan	7939.6	45.4%	4767.1	27.3%	2801.9	16.0%	1978.4	11.3%	17487.0
Platte	1600.7	10.1%	3161.3	19.9%	4477.8	28.1%	6684.6	42.0%	15924.5
Wyandotte	127.1	9.6%	121.8	9.2%	329.1	25.0%	740.5	56.2%	1318.4
Atchison	530.3	14.8%	1228.6	34.3%	1572.8	43.9%	252.3	7.0%	3584.0
Leavenworth	140.5	3.6%	403.7	10.3%	1153.4	29.3%	2238.5	56.9%	3936.1
Doniphan	2857.1	28.4%	2557.8	25.4%	2809.2	27.9%	1831.0	18.2%	10055.1

Products – Distance Grids

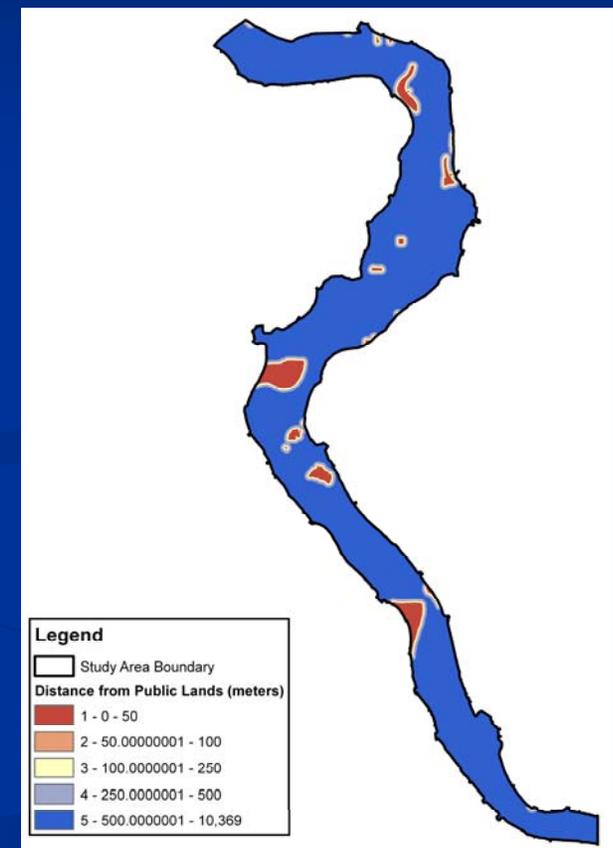
Distance from Urban/Impervious



Distance from Natural Vegetation

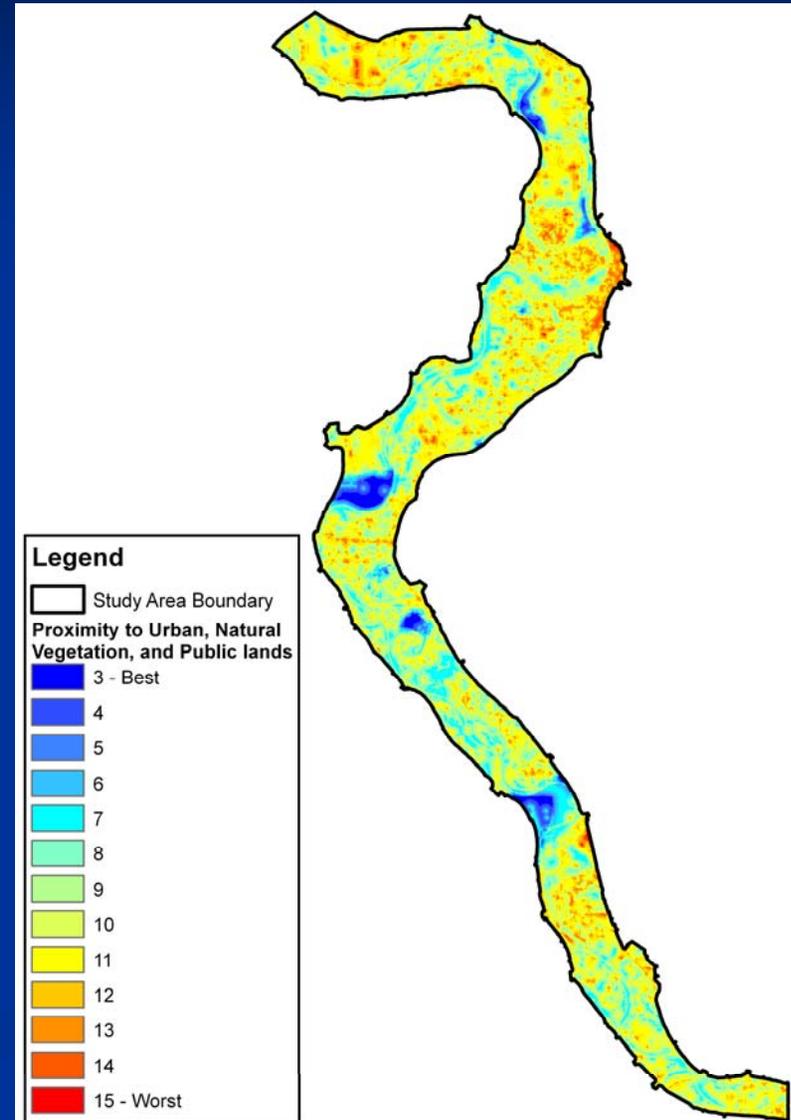


Distance from Public Lands



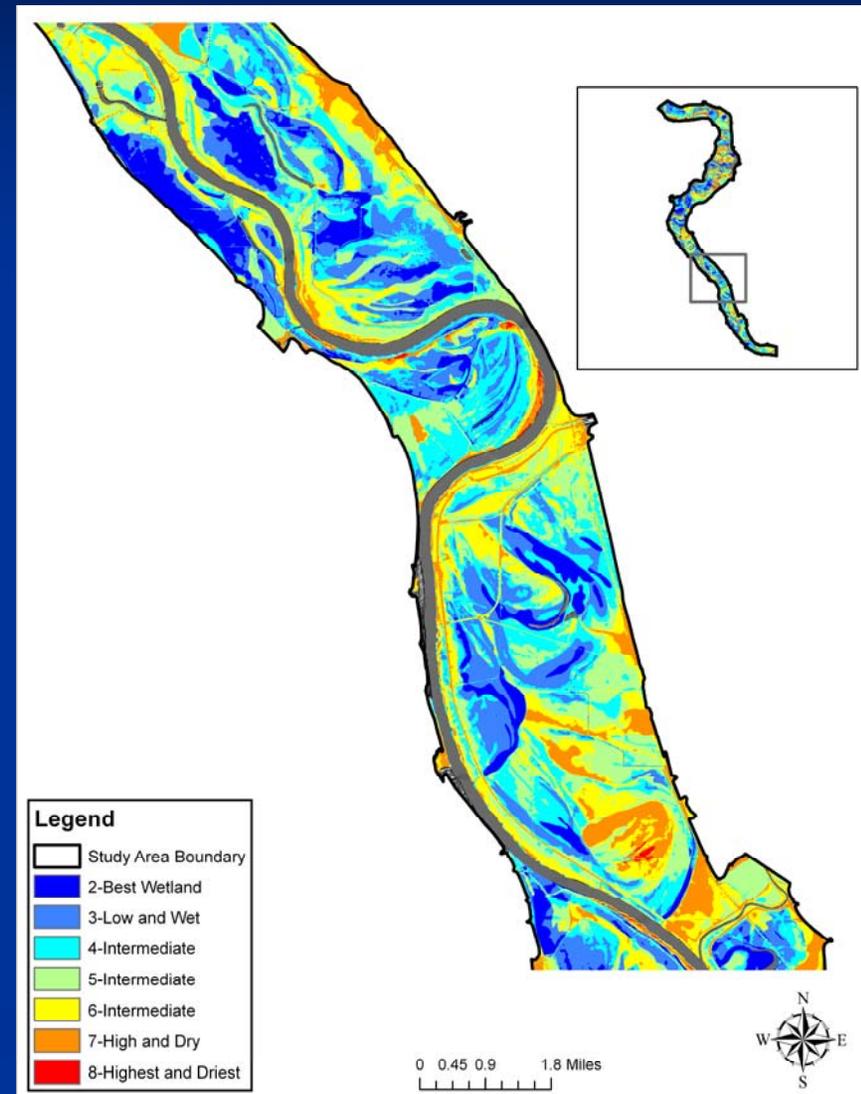
Products – Distance Grids

- Landscape Context
 - Sum distance grids
 - Ranked 3 (best) to 15 (worst)



Products – Potential Restoration Areas

- Holbrook et al. (2006)
 - Ideal locations for wetland restoration have relatively low elevation and slow rates of soil infiltration
- Relative Elevation + Soil Hydrologic Group
 - Relative Elevation
 - 1 – Low Elevation
 - 2 – Medium Low Elevation
 - 3 – Medium High Elevation
 - 4 – High Elevation
 - Soil Hydrologic Group
 - 1 – Very Slow Infiltration
 - 2 – Slow Infiltration
 - 3 – Moderate Infiltration
 - 4 – High Infiltration



Ronnie Lea
GIS Specialist
MoRAP
rlea@usgs.gov
573-441-2793

<http://www.cerc.usgs.gov/morap/>

Products – Solar Insolation

- Shortwave radiation received at surface
- Shortwave program
 - Kumar, Skidmore, and Knowles (1997)
- DEM

