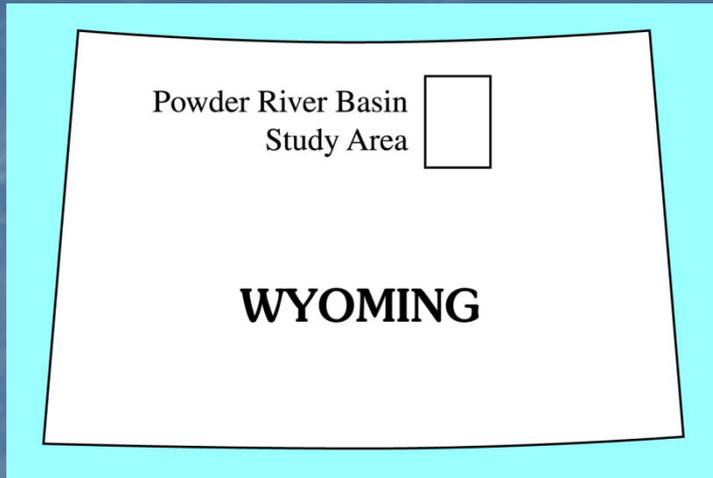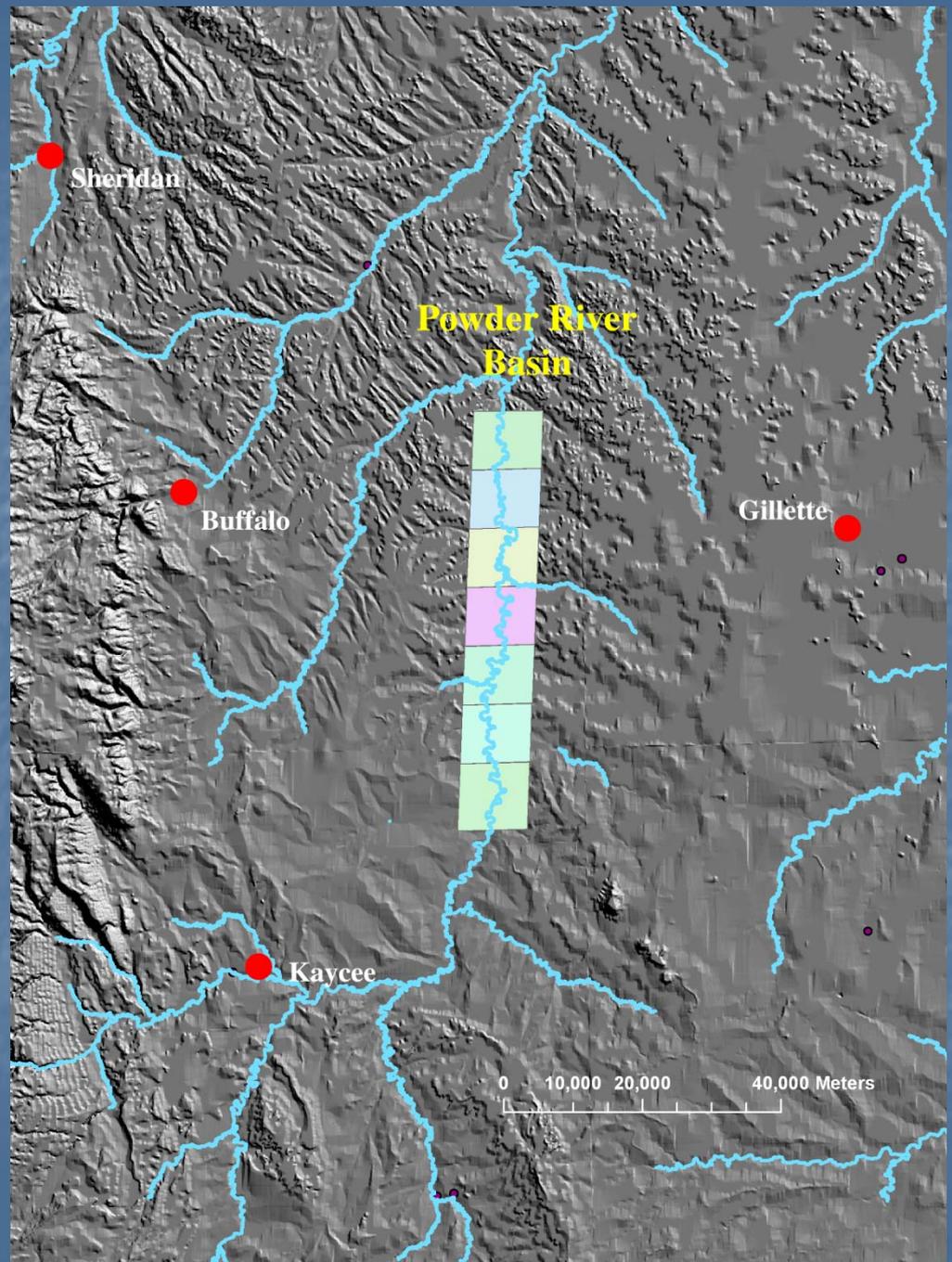# Object Oriented Classification of Riparian and Aquatic Habitats Along a Section of the Powder River in North Central Wyoming

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Index Map

Powder River Basin
Study Area ☐

WYOMING

Quickbird scenes along the Powder River are shown in pastel blocks

Sheridan

Powder River Basin

Gillette

Buffalo

Kaycee

0   10,000 20,000   40,000 Meters

≋USGS

Cropped Color Infrared Quickbird Image

Advantages of Object Oriented Classification

- Each image object represents a definite spatially connected region of the image.
- The pixels of the associated region are linked to the image object with an **is-part-of** link object.
- The object oriented approach takes advantage of all dimensions of remote sensing, including the following:

  - Spectral (multispectral bands including panchromatic)
  - Spatial (area, length, width, direction)
  - Morphological (shape parameters, texture)
  - Contextual (relationship to neighbors, proximity analysis)
  - Temporal (time series)

(Navulur, 2007)

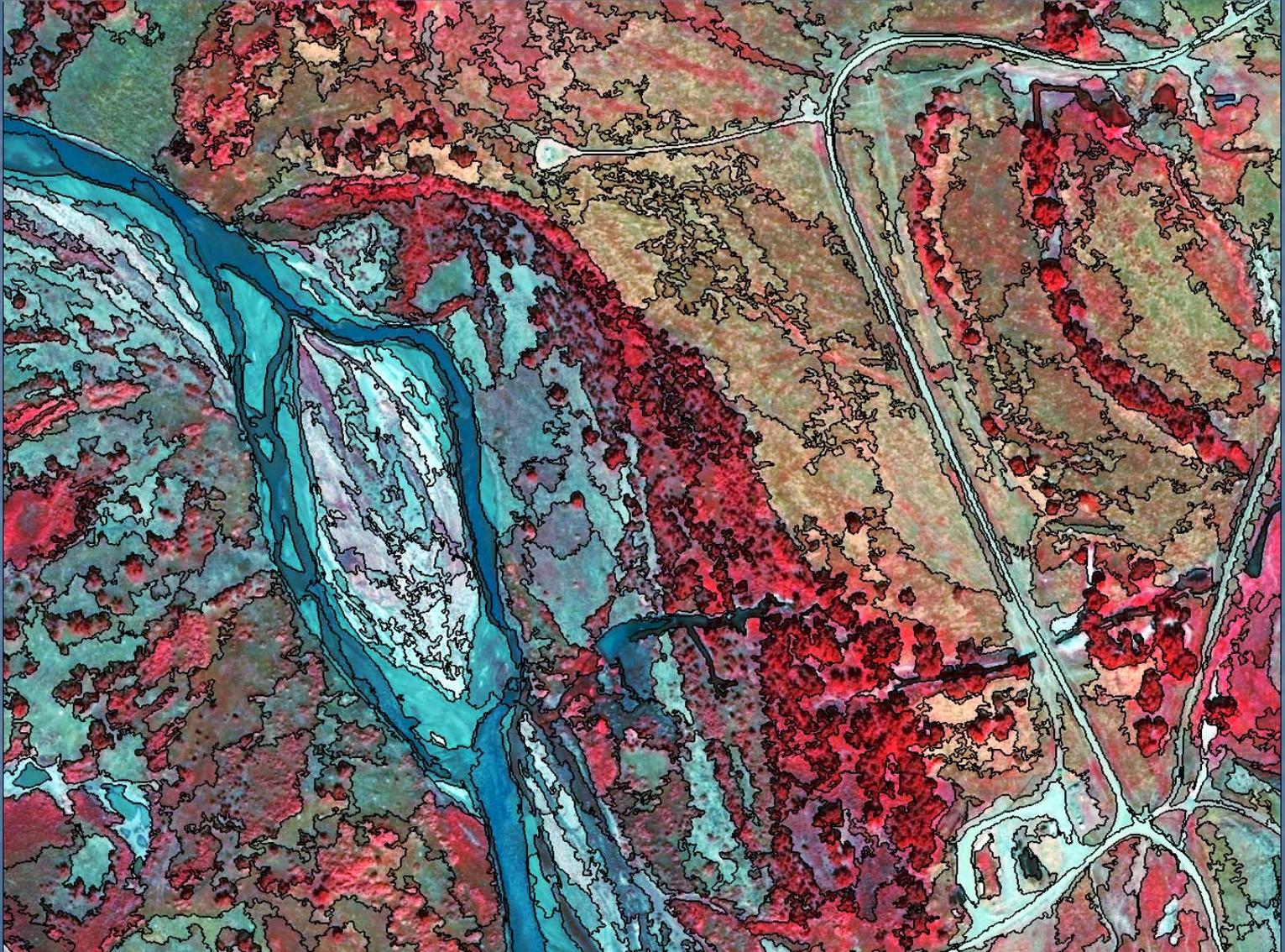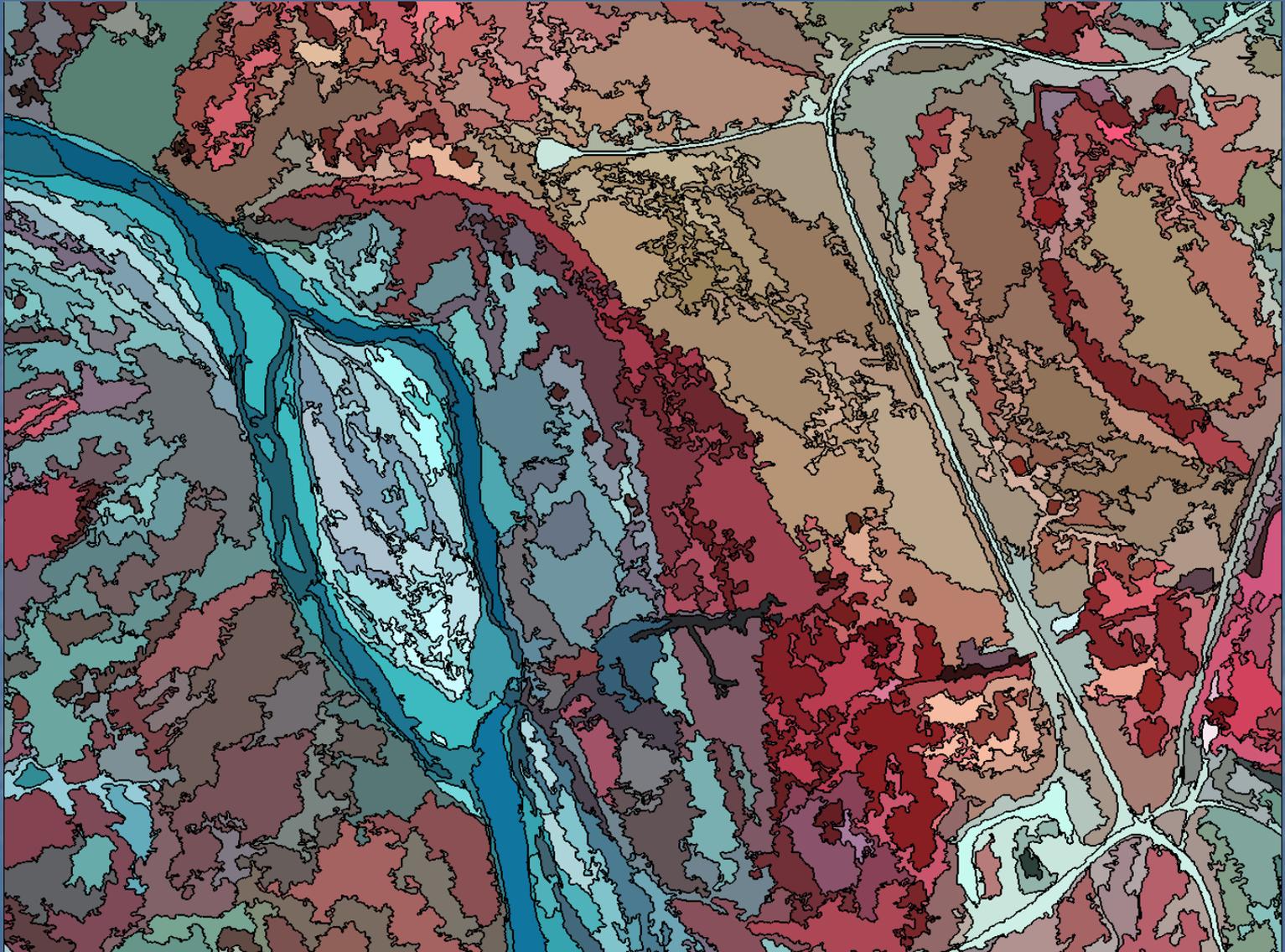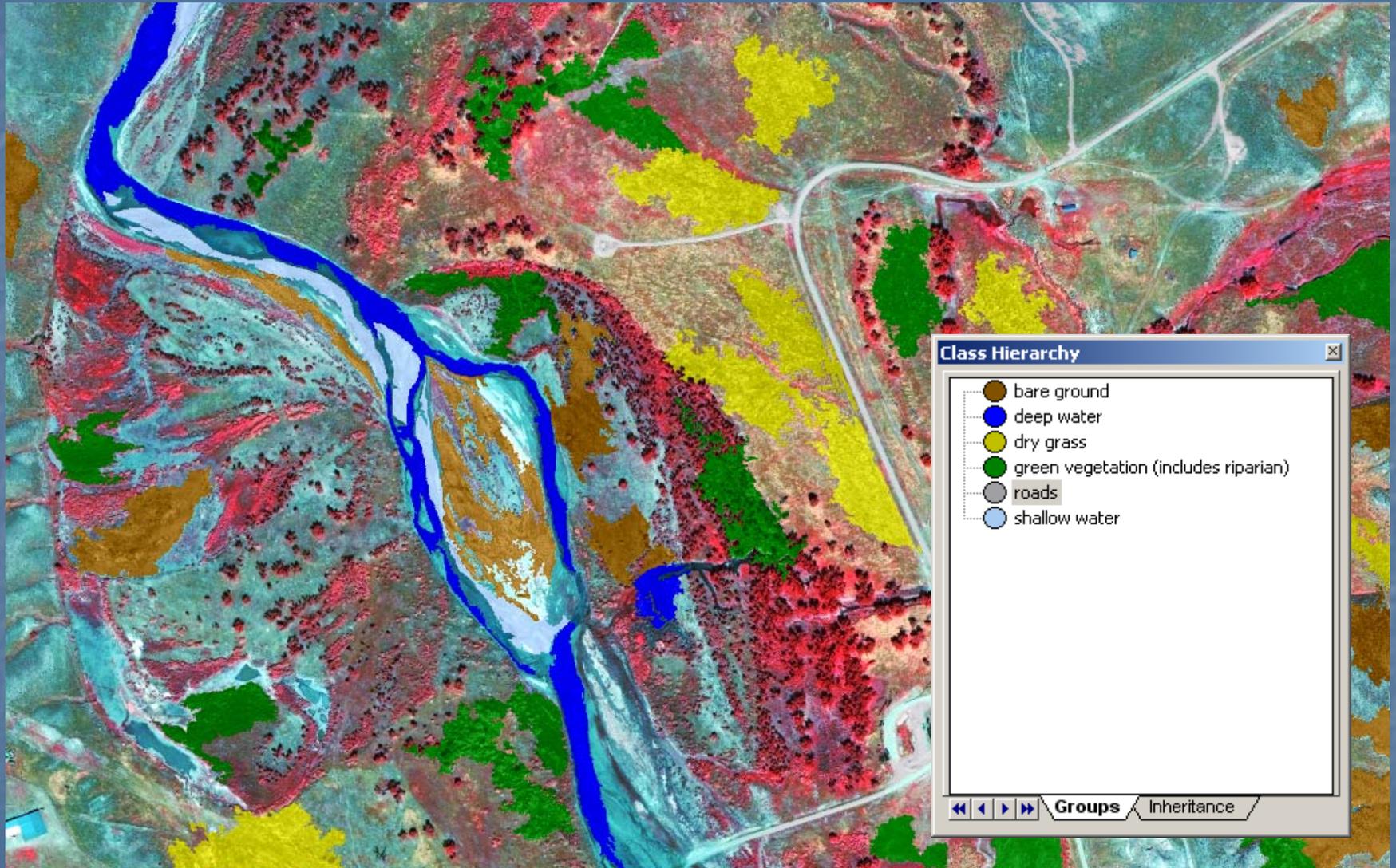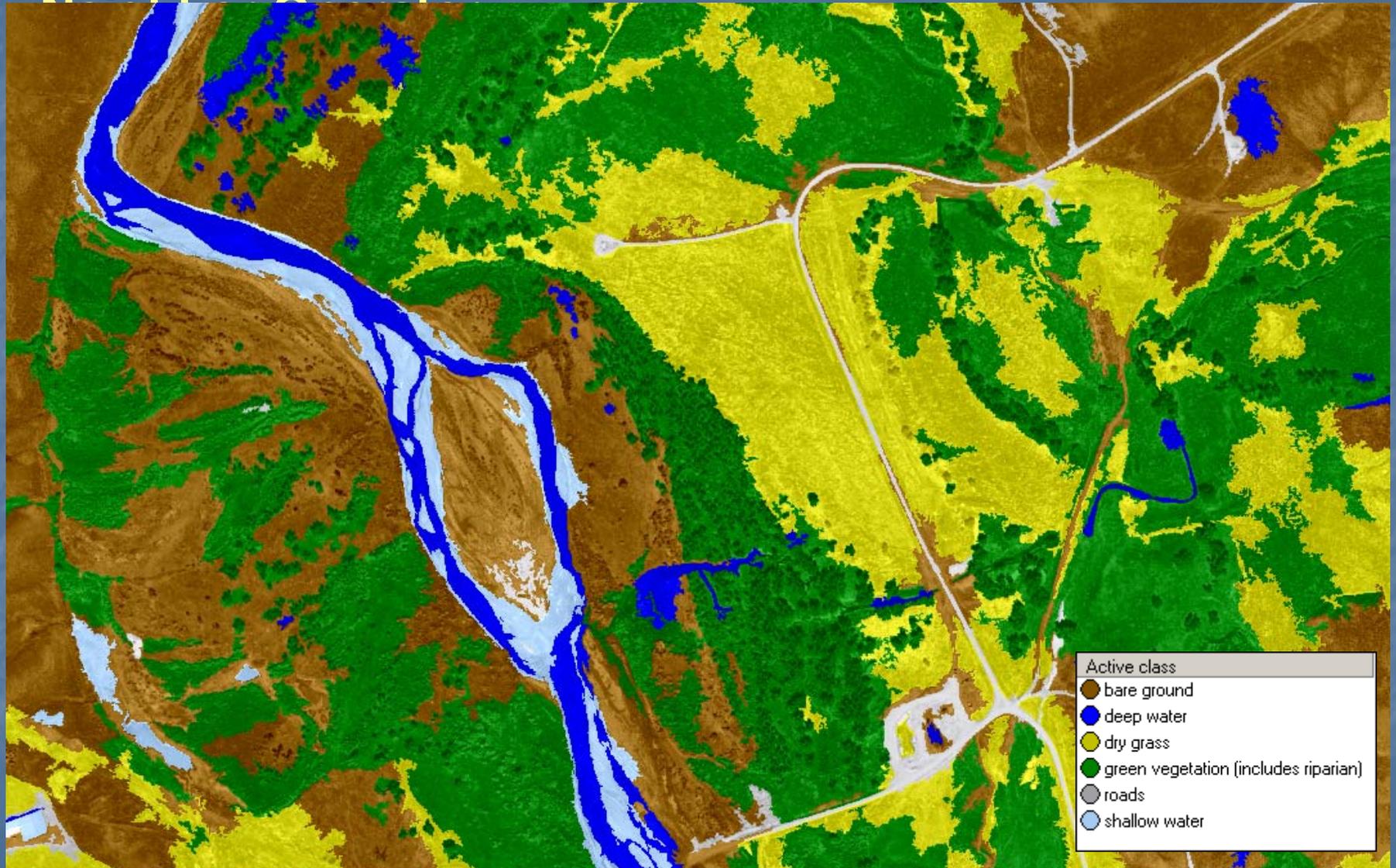# Example of Definiens Segmentation Process Result

Image Converted from Pixel Space to Object Space

Class Hierarchy

- bare ground
- deep water
- dry grass
- green vegetation (includes riparian)
- roads
- shallow water

Groups | Inheritance

≋USGS

Classification Results Using Standard Nearest

Active class
- bare ground
- deep water
- dry grass
- green vegetation (includes riparian)
- roads
- shallow water

≋USGS

Results and Discussion

- Some classes mapped fairly well, including deep and shallow water and roads

- Water was over-mapped in some areas

- Green vegetation was under-mapped in some areas

- Results could be improved by adding additional rule sets such as shape, texture, relations to neighbor objects

- In the case of this study, only the Standard Nearest Neighbor operator was used