

Relating Land Cover Changes to Stream Water Quality in North Carolina



Topic: Urban environmental quality

Problem Statement: Analysis of land cover changes requires both an understanding of environmental connections and active thinking by the analyst. How can remote sensing and GIS support effective land cover analysis?

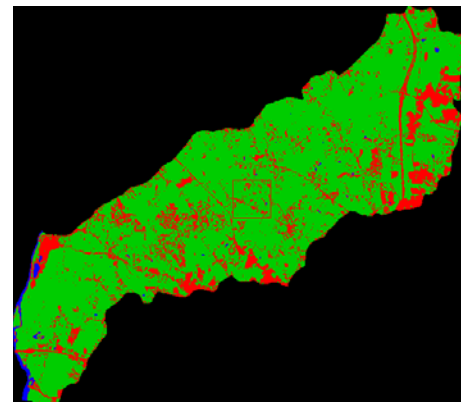
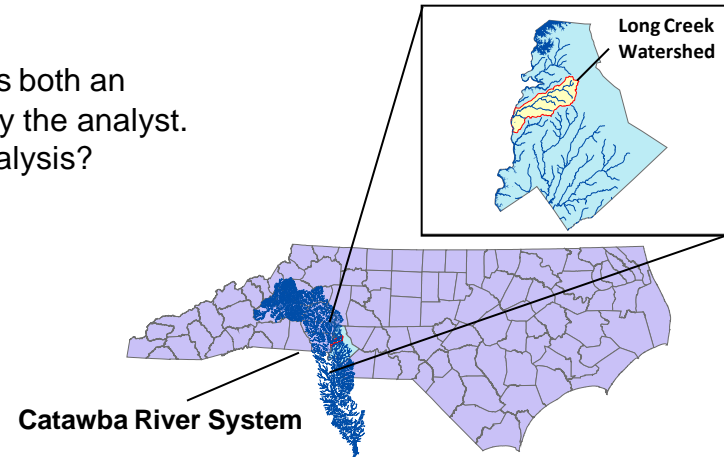
Level: Intermediate

Software: ArcGIS 9.3, ENVI 4.5

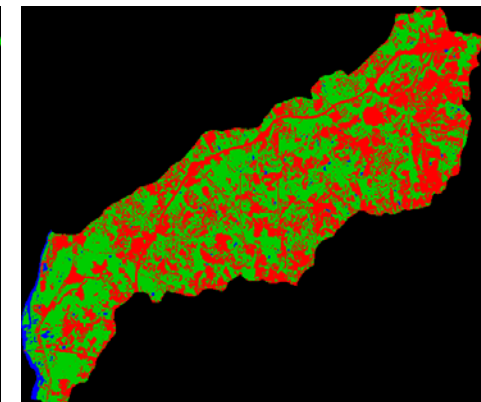
Description: In April 2008, the advocacy group American Rivers named the Catawba the most endangered river in America. This Learning Unit examines land cover changes between 1988 and 2008 in a tributary system, Long Creek Watershed. Long Creek is entirely located within Charlotte, NC, the largest city in the Catawba Watershed. Land cover classifications are quantitatively compared for differences, with the results exported to ArcGIS to produce a map highlighting these differences.

Students develop geospatial critical thinking skills by forming hypotheses and writing qualitative interpretations of satellite imagery. Pedagogically, the LU emphasizes that complex analyses (e.g., those using remotely sensed data) invariably require deconstruction to simple component steps.

Key words: Land cover, urbanization, image processing, unsupervised classification, band math, GPS field validation, GIS integration



1988 Long Creek Watershed



2008 Long Creek Watershed

Blue= Water, Green = Vegetation, Red = Non-vegetated Area