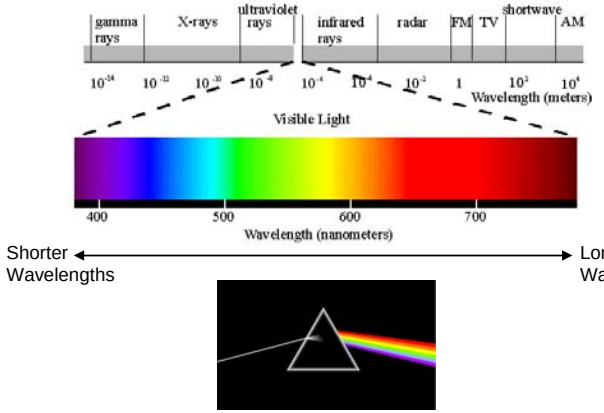
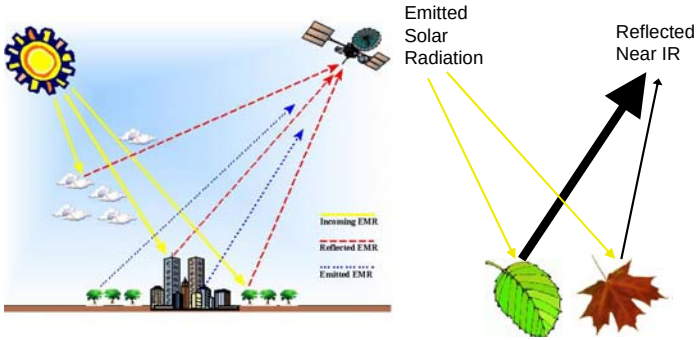
City of Pasadena's Tree Canopy Analysis

Identifying the Forest from the Trees

Electromagnetic Spectrum

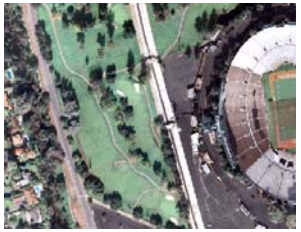


Electromagnetic Reflectance



3 Band Photos

Regular Photos
- Red 255,0,0
- Green 0,255,0
- Blue 0,0,255



Near Infra-Red Photos
- Near IR 255,0,0
- Red 0,255,0
- Green 0,0,255

Finding Vegetation

Normalized Difference Vegetation Index (NDVI)

$$NDVI = \frac{(NIR - RED)}{(NIR + RED)}$$

- Used to identify vegetation based on Near IR reflectance
- The higher the value the more healthy the vegetation
- Inverse can also be used to find water

Elevation Models

Bald Earth Model

Representation of Earth's surface

Surface Model

Includes terrain and objects above terrain

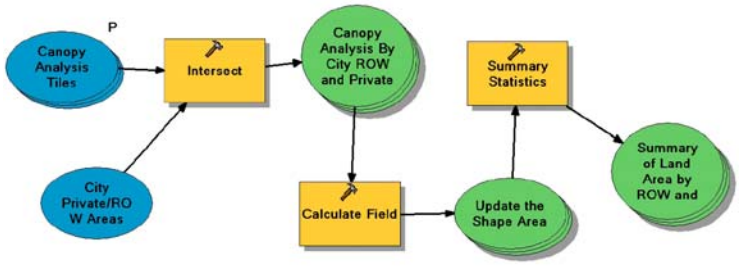
- Buildings
- Trees

Tying it All Together

- Vegetation versus Non-Vegetation
  - Vegetation NDVI value of 0.035 or greater
- Canopy versus Turf
  - Elevation difference 8 feet or greater

Resulting Tree Canopy

Canopy Land Area Model*



*Model was created using ArcGIS 9.3

Results

- The City of Pasadena contains 6.58 square miles of tree canopy!
- Over 28 percent of the City of Pasadena is covered by tree canopy!
- Over 18 percent of Pasadena's tree canopy is located within the public right of way!