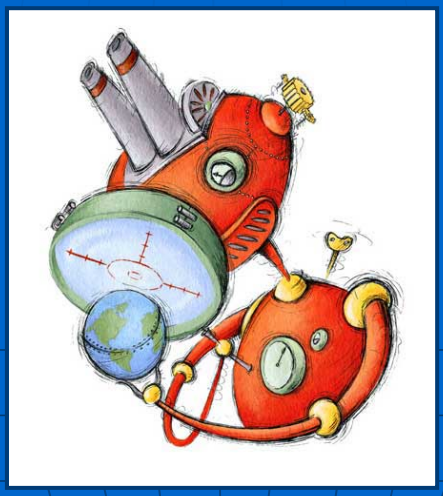
Using GIS to Identify Suitable Commercial Properties for Stormwater Collection and Reinfiltration



Natural Resource Damages (NRD)

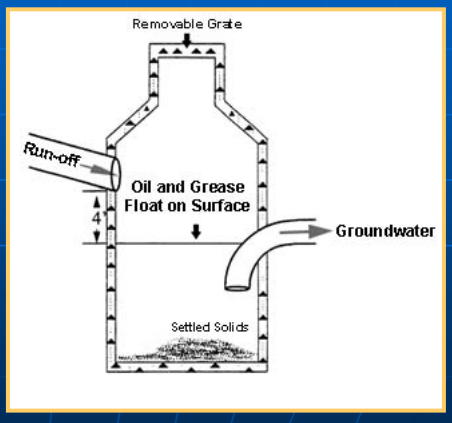
- **Natural Resources** - land, fish, wildlife, biota, water wetlands, and other resources, such as public beaches and parks, that are managed by or held in trust by the government for the benefit of the public .
- **Natural Resource Injuries:** any adverse change or impact of a discharge into or on a natural resource or impairment of natural resource services, whether direct or indirect, long-term or short-term, and includes the partial or complete destruction or loss of the natural resource. Injuries can be ecological based, such as the contamination of a stream habitat and/or use based, such as the public's inability to use the same stream for fishing.

Natural Resource Damages (NRD)

- **Restoration:** is the remedial action that returns the natural resources to pre-discharge conditions. It includes the rehabilitation of injured resources, replacement, or acquisition of natural resources and their services, which were lost or impaired. Restoration also includes compensation for the natural resource services lost from the beginning of the injury through to the full recovery of the resource.
- **Natural Resource Damages:** the dollar value of the restoration that is necessary to restore the injured resource and to compensate the citizens of the State for the injury to natural resources as a result of a discharge.

Proposal

- Collect stormwater run-off from applicable properties and reinfiltrate
- Earn Groundwater NRD replacement credits
- Sell credits to PRPs



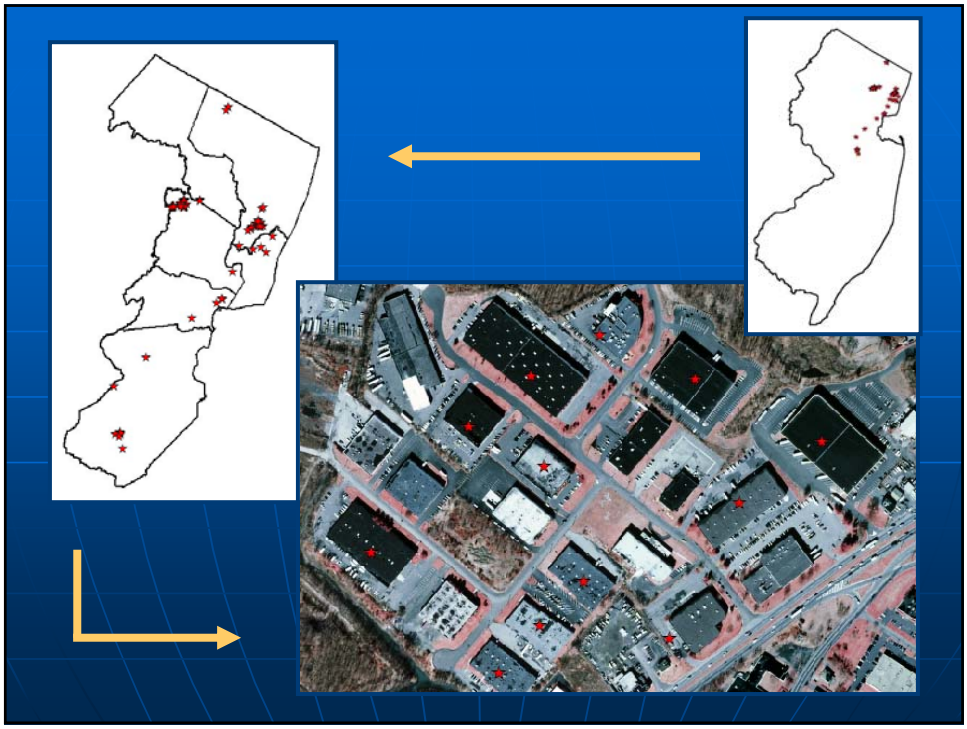
GIS Objectives

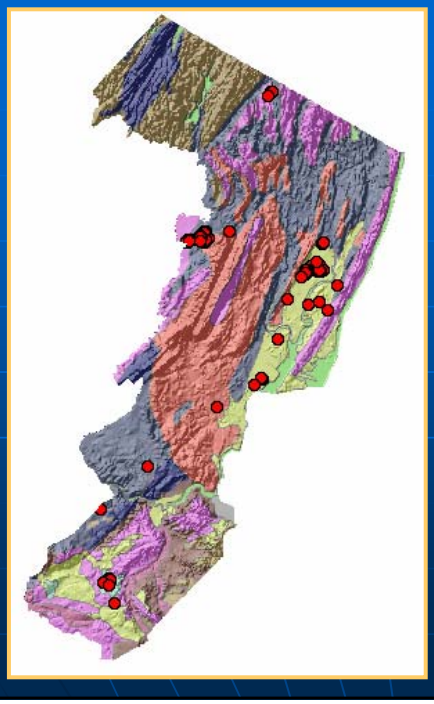
- Locate properties on a map
- Obtain high resolution aerial photos
- Determine depth to groundwater
- Determine soil permeability
- Determine underlying geology

Determine which properties have suitable characteristics for stormwater capture and reinfiltration

Methods

- Create property attribute table, geocode addresses
- Locate and download aerial photos for each property
- Download and re-project STATSGO soil data
  - join COMP, LAYER and INTERP tables to layer
- Create USGS well data attribute table and geocode well locations
- Create an interpolated depth-to-water surface by the Co-Kriging method using the well data and the DEM as variables.
- Add depth-to-water, soil permeability and soil type data to property attribute table
- Weight these attributes and locate suitable properties

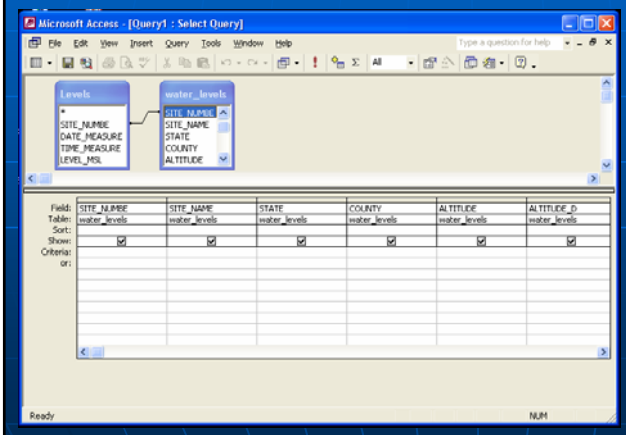


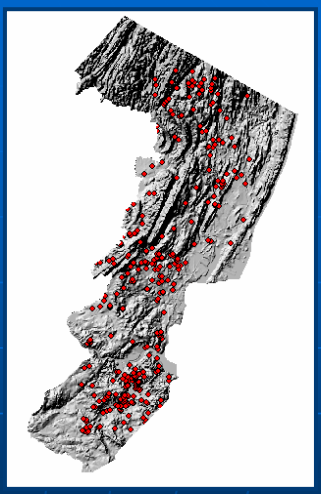


Soil Permeability

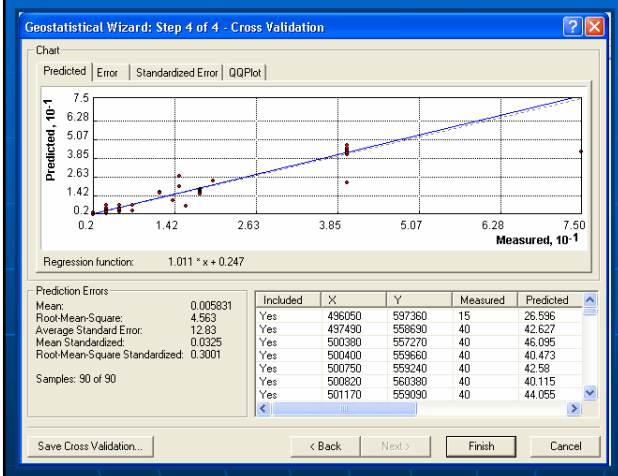
- Entered soil permeability rates and appropriate weights into property attribute table
- Permeability value = The maximum value for the range in permeability rate for the soil layer or horizon, expressed as inches/hour

Well Location Map



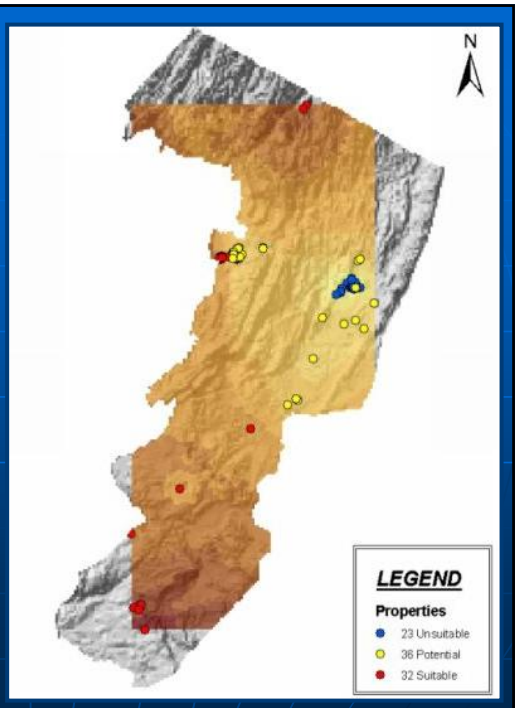


Interpolated Depth to GW Surface



Results

- Identified those sites with suitable depth to groundwater, geology and permeability
- Additionally identified potential sites that need additional inspection



Conclusions

- GIS has proven to be a useful tool for this application
- Ideally I would like to have better well data
- Would like to have calculated percolation values but needed better well data