APPENDIX G
Planning Tools

Better Site Design Tool Kit
Mt. Top Mapping User Guide
Funding Opportunities

Hunter Corridor Regional Planning Study

Better Site Design
Tool Kit

For
Town of Hunter
Village of Hunter
and
Village of Tannersville

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What is Better Site Design?

Better Site Design (BSD) seeks to minimize negative impacts of new and re-development on the environment, specifically water resources. Structural and non-structural techniques can be designed and employed to temporarily store or treat stormwater run-off in order to mitigate flooding and reduce pollution caused by stormwater run-off. Techniques used in BSD include: reduction of impervious cover; preservation of natural features; conservation and cluster subdivision; planned unit development; and, use of natural features for source control.

Benefits of Better Site Design

- Protection of important environmental features
- Generation of smaller loads of stormwater and associated pollutants
- Reduction of soil erosion during construction
- Flexibility in design options
- Reduction of development costs
- Facilitates compliance with wetland and other regulations
- Increase in property values
- Pedestrian friendly neighborhoods
- More attractive suburban landscape
- Reduction in vehicular speeds resulting in increased safety

Phosphorus

Phosphorus is a vital nutrient needed by all living things. But, an increase in the amount of phosphorus entering bodies of water can lead to extremely harmful algal growth. This excess amount of algae can cause water quality problems such as decreased water clarity, odors and loss of habitat.

Naturally, phosphorus can be found in soils, plant and animal materials. It is transported primarily by run-off. Wastewater treatment plants and food processing industries are examples of significant phosphorus inputs. Phosphorus can be found in urban and suburban settings in items such as detergents, fertilizers, pesticides, manure, paint, household cleaners and carpet materials.

Phosphorus is typically transported through stormwater run-off. The addition of impervious surfaces along with the removal of vegetation and clearing and grading will increase the amount of run-off, which in tern, increases the amount of phosphorus entering local bodies of water.

Prevention of run-off can be a highly effective means for reducing phosphorus loading. It can also reduce the size and cost of downstream controls while increasing the water quality efficiency. Reducing imperviousness and achieving disconnection of impervious areas are vital to reducing run-off volumes. Increased infiltration of stormwater can be achieved through small-scale distributed controls, such as rain gardens, stormwater planters, , draining roof run- off to landscaped areas, draining driveways and walkways to landscaped areas, green roofs, rainwater cisterns or use of porous pavements.

Electronic Resources

1. Town of Hunter: www.townofhuntergov.com/
2. Village of Hunter: www.hunterchamber.org/village_of_hunter.php
3. Village of Tannersville: www.tannersvilleny.org/
4. Greene County Soil & Water Conservation District
   a. Pond Management Services: www.gcswcd.com/pond/
      i. Technical assistance and fish stocking services
      ii. Pond construction information
      iii. Weed Management
   b. GIS Services: www.gcswcd.com/publications/GISbrochure.pdf
      i. Aerial Photography & Agricultural Districts
      ii. Real Property Tax Parcels
      iii. Soils & Topography
      iv. Water bodies, Streams &Wetlands
      v. FEMA Floodplains
      vi. Watersheds
   c. Resources on erosion prevention and conservation planting
5. NYSDEC
   a. Open Space Conservation Plan: www.dec.ny.gov/lands/47990.html
   b. Smart Growth: www.dec.ny.gov/lands/45970.html
   c. Conservation Easements: www.dec.ny.gov/lands/41156.html
      i. Permanent legal agreements entered into by a landowner and state
6. Green County Chamber of Commerce: www.greenecounty-chamber.com
   a. Green Technology:
   b. 2010 Leadership Greene Program
      i. Motivated individuals selected from business, professional, educational, governmental and not-for-profit organizations in Greene County
      ii. Develop leadership skills, network with prominent business leaders, build your professional network, meet new people!
7. Greene County
   a. Planning: http://greenebusiness.com/planning/programs-services
   b. Mapping: http://greenebusiness.com/mapping/mapping-services
8. Greene County IDA: /www.greeneida.com/index.php
9. http://www.greenegovernment.com

Definitions

Better Site Design (BSD)/Best Management Practice (BMP) – As referred to in this guide, incorporate non-structural and natural approaches to reduce the effects of stormwater.

Bioretention – As referred to in this guide, is the filtering of stormwater runoff through a landscape feature to remove pollutants.

Compost – As referred to in this guide, is a mixture of decaying vegetation, food waste, yard waste, and debris that is used as a natural fertilizer.

Fertilizer – As referred to in this guide, is any natural or chemical substance used to promote plant growth. It contains elements such as nitrogen and phosphorus.

Hydrology – As referred to in this guide, concerns the movement of water over land.

Impervious Cover – As referred to in this guide, is all materials or structures that prevent water from infiltrating into the underlying soils. They can include: paved parking lots, roads, sidewalks, and roofs.

Limit of Disturbance (LOD) – As referred to in this guide, is the area on a specific site where the land can be disturbed and used for construction.

Natural Conservation Area – As referred to in this guide, is any undisturbed land or previously disturbed land that has recovered. Previously disturbed land should retain pre-development hydrologic and water quality characteristics to be considered a natural conservation area.

Pesticide – As referred to in this guide, is any natural or chemical substance used to kill insects and rodents. It contains elements such as nitrogen and phosphorus.

Phosphorus – As referred to in this guide, is an element that is found naturally or in substances such as lawn fertilizers. It contributes to increased algal growth in bodies of water. It is needed by plants for proper functioning but also can have negative impacts on aquatic environments.

Redevelopment – As referred to in this guide, is any activity associated with land disturbance for construction, alteration, or improvement on a site where land use is currently commercial, institutional, or residential.

Stormwater – As referred to in this guide, is water that is not absorbed or infiltrated into the soil after a rain event.

Stormwater Run-off – As referred to in this guide, is run-off that occurs during or after a rain storm. The water cannot infiltrate the ground so it flows on the surface and eventually ends up in a body of water.

Street Right-of-Way – As referred to in this guide, is publicly owned land comprised of the street and land on both sides, which holds sidewalks, sewers, and storm drains.

Hunter Corridor Regional Planning Study

Better Site Design Tool Kit

For
Development, Planning & Site Plan Review

Preservation of Natural Features

Natural Features Include:
- Undisturbed forests
- Native vegetated areas
- Natural terrain (slope, hydrology, and erodible soils)
- Riparian corridors
- Wetlands
- Naturally vegetated buffers along streams, rivers, shorelines, and wetlands
- Floodplains
- Critical habitat areas
- Areas with Historical Important
- Areas that are important to the community

Why Implement this Practice?
- Provides a framework for site design and layout
- Preserves site's natural hydrology, drainageways, and water balance
- Reduces erosion
- Promotes filtration and infiltration
- Treats stormwater and improves water quality
- Reduces structural stormwater management requirements
- Native vegetation is important to viability of surroundings
- Reduction of phosphorus loading
- Lowers costs associated with clearing, grading and operation and maintenance
- Reduces amount of structural stormwater management techniques required

Source: www.community.mynorth.com

How to Implement this Practice:
- Delineate and define (using mapping and field-reconnaissance) natural conservation areas before designing site layout
- Establish limits of disturbance (LOD) for your site
- Avoid sensitive areas mentioned above
- Protect areas throughout the project's design, construction, and occupancy stages
- Use minimum dimensions when designing impervious cover
- Do not develop land with >15% slope
- Preserve natural topography by designing to fit with natural features
- Use BSD techniques such as reduction of impervious cover and smaller lot dimensions
- Implement the Model Development Principles described on page 5

Reduction of Impervious Cover
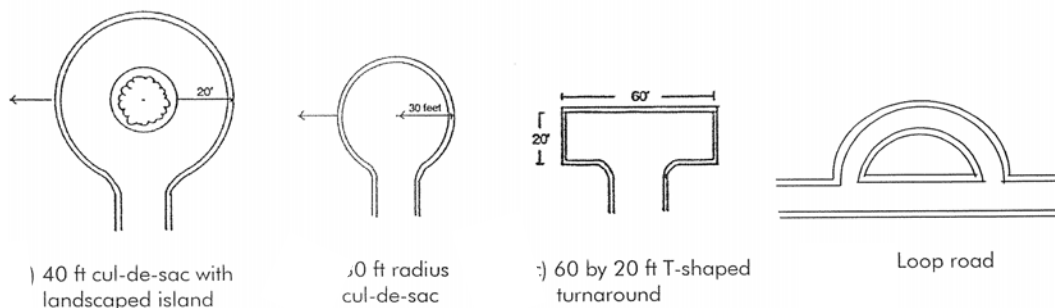
Impervious Cover Includes:
- Residential Streets
- Sidewalks
- Driveways
- Building Footprint
- Cul-de-sacs and turnarounds
- Parking Areas
- Any surface that cannot absorb or infiltrate water
- Street Right-of-Way

Why Implement this Practice?
- Reduces the amount of stormwater run-off and pollutants generated (i.e. phosphorus)
- Reduces construction and maintenance costs associated with materials and land clearing
- Increases vegetated areas and reduces paved areas
- Safer residential streets

How to Apply this Practice:
- Design different site layouts to optimize the reduction of impervious cover
- Minimize required street/sidewalk/driveway width and length; dimensions should be based on traffic demand and emergency vehicle access
- Use smaller side and front yard setbacks to allow more houses per street and shorter driveways
- Locate sidewalks on one side of the street
- Reduce the radius of cul-de-sacs; use looped roads and T-shaped turnarounds
- Implement multiple story parking garages where applicable
- Enforce maximum and minimum parking ratios to reduce excess parking space
- Use compact car parking spaces
- Eliminate un-needed drive lanes and drive isles
- Implement vegetated stormwater practices to increase pervious cover (i.e. vegetated buffer, bioretention area, rain garden, infiltration trenches, etc.)
- Reduce directly connected impervious areas
- Implement grass spill over parking areas
- Set maximum, rather than minimum, size requirements

) 40 ft cul-de-sac with landscaped island ,0 ft radius cul-de-sac :) 60 by 20 ft T-shaped turnaround Loop road

Source: *Better Site Design: A Handbook for Changing Development Rules in Your Community*, Center for Watershed Protection

Model Development Principles from the Center for Watershed Protection:

These Model Development Principles can assist developers in reducing impervious cover during the design phase of development.

Minimum Dimensions for Reducing Impervious Cover	
Street width allowed in low density residential developments that have less than 500 ADT*	18-22 feet
Right of way width for a residential street	< 45 feet
Radius allowed for cul-de-sacs	< 35 feet
Parking ratio for a professional office building	< 3 spaces/1000ft^2 GFA**
Parking ratio for a shopping center	< 4.5 spaces/1000ft^2 GFA
Parking ratio for a single family home	< 2 spaces/1000ft^2 GFA
Stall width for a standard parking space	< 9 feet
Stall length for a standard parking space	< 18 feet
Requirement for front setbacks for a 1/2 acre lot	< 20 feet
Requirement for rear setbacks for a 1/2 acre lot	< 25 feet
Requirement for side setbacks for a 1/2 acre lot	< 8 feet
Sidewalk width allowed in the community	< 4 feet
One lane driveway width	< 9 feet
Two lane driveway width	< 18 feet

*ADT = Average Daily Trips
** GFA = Gross Floor Area
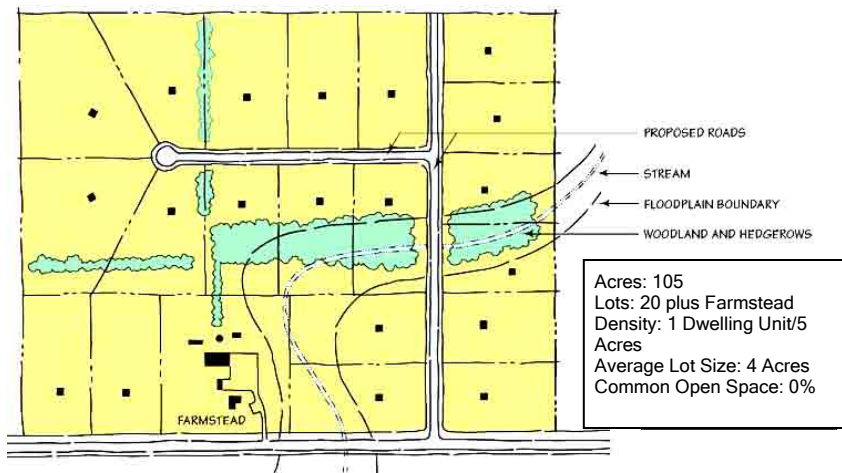
Conservation Subdivision

Why Implement this Practice?
- Preserves conservation areas, natural hydrology, drainageways, and other important features
- Reduces the need for land disturbance
- Reduces impervious areas, associated run-off and pollutants (i.e. phosphorus)
- Reduces construction, stormwater maintenance, and material costs
- Reduces costs associated with the installation of water, gas, and electric services
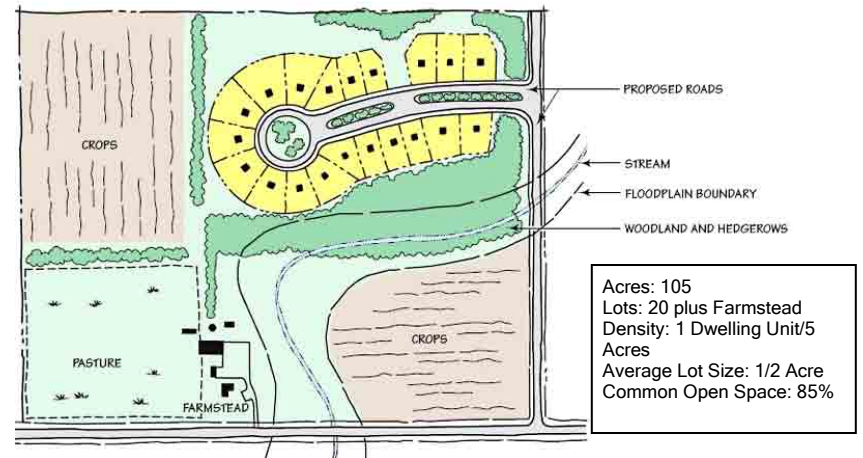- Fosters creativity in design and implementation of subdivision

How to Apply this Practice:
- Define natural conservation areas to be protected before site design phase
- Design site so development is concentrated in the least sensitive area
- Implement flexible lot shapes along with smaller setback and frontage distances
- Use BMP techniques to reduce impervious cover and stormwater run-off
- Clearly state how open space will be managed (conservation easement, land trust, community association)
- Focus infrastructure on serving pedestrian traffic rather than vehicular traffic
- Include, where applicable, public transit stops, bike trails,

Conventional Subdivision Design

PROPOSED ROADS
STREAM
FLOODPLAIN BOUNDARY
WOODLAND AND HEDGEROWS
FARMSTEAD

Acres: 105
Lots: 20 plus Farmstead
Density: 1 Dwelling Unit/5 Acres
Average Lot Size: 4 Acres
Common Open Space: 0%

Conservation Subdivision Design

PROPOSED ROADS
CROPS
STREAM
FLOODPLAIN BOUNDARY
WOODLAND AND HEDGEROWS
PASTURE
CROPS
FARMSTEAD

Acres: 105
Lots: 20 plus Farmstead
Density: 1 Dwelling Unit/5 Acres
Average Lot Size: 1/2 Acre
Common Open Space: 85%

Planned Unit Development

A Planned Unit Development (PUD) provides flexibility in site design and density to foster preservation of open space and reduction in impervious surfaces. Project characteristics including site constraints and developer/community goals drive site design and density. Flexibility results in a development that is better planned, contains more amenities, more desirable to live in than one produced in accordance with typical zoning ordinance and subdivision controls.

Density Bonus

A density bonus will allow a developer to plan for higher densities if they preserve a specified amount of land, provide community recreational facilities, or incorporate other amenities desired by the community.

Mixed Use Development

Mixed Use Developments include an area that combines residential, commercial and industrial land uses. This allows community members to live and work locally. They contain many of the same features as cluster subdivision, like open space, recreational facilities and shared facilities such as parking.
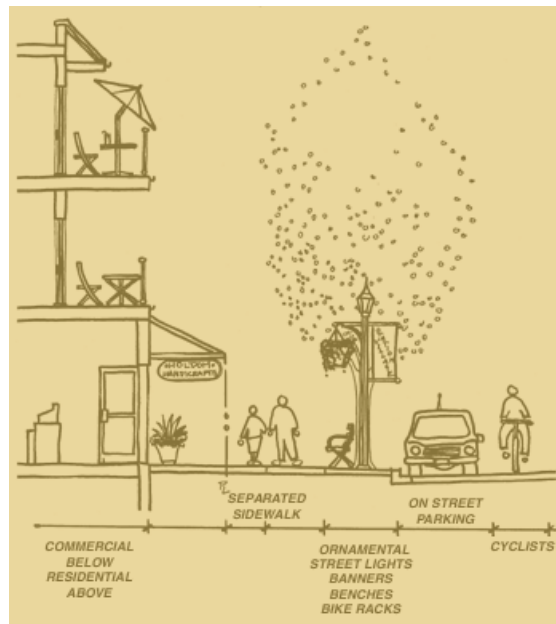
Source: www.city.burnaby.bc.ca

Zoning

Zoning is a tool used by local governments to divide up land into areas reserved for specific purposes such as residential, industrial, and commercial. This practice aids Better Site Design which helps to mitigate stormwater run-off. There are a number of different types of zoning that a community can choose to implement. The table below describes some techniques. More techniques can be found on the EPA website (www.epa.gov).

Land Use Planning Technique	Description	Utility as a Watershed Protection Technique
Watershed-Based Zoning	Watershed and subwatershed boundaries are the foundation for land use planning	Protects receiving water quality on the subwatershed scale by relocating development outside of particular subwatersheds
Incentive Zoning	Applies bonuses or incentives to encourage creation of amenities or environmental protection	Encourages development within a specific watershed or to obtain open space in exchange for a density bonus at the site level
Performance Zoning	Specifies a performance requirement that accompanies a zoning district	Requires additional levels of performance within a subwatershed or at the site level
Impervious Overlay Zoning	Specific overlay zoning that limits total impervious cover within mapped districts	Protects receiving water quality at the subwatershed and site level

How to Implement **Watershed-Based Zoning**:
1. Conduct a comprehensive stream study
2. Measure current levels of impervious cover
3. Verify the relationships between impervious cover and stream quality
4. Make projections for future impervious cover
5. Classify each watershed based on stream management and impervious cover
6. Modify your current "master plan" to correspond to subwatershed impervious cover targets and other management practices
7. Incorporate your community's main concerns from larger watersheds into the smaller individual zones
8. Adopt strategies specific to each zone
9. Perform long-term monitoring of your watershed

	Positive Economic/Environmental Impact	Negative Economic/Environmental Impact
Developer/Builder	-	Cost of land; Location constraints
Adjacent Property Owner	Property Value	-
Community	Business Attraction; Protects land from adverse uses	-
Local Government	Reduced clean up	Staff and budget resources

Incentive Zoning & Density Bonus:

Incentive zoning relies on motivation given to developers to persuade them to create and implement certain land uses. A developer is granted the right to build more intensively on a property or given a bonus in exchange for a design that your community considers beneficial. Developers can gain an increase in profits from the more intensive use of the property. Your community can use incentive zoning to promote more cluster development, promote open space designs, or produce other desired amenities such as low income housing.

A density bonus allows developers to increase development on a property in exchange for helping the community achieve public policy goals, or in exchange for lower rents and sale prices. This practice works best where growth pressures are strong and land availability is limited. It is commonly used for environmental protection and low income housing. A density bonus can be used to promote open space design and conservation of natural resources.

Performance Zoning:

Performance zoning factors can include traffic and noise generation limits, lighting requirements, stormwater run-off quality and quantity, and criteria and protection of wildlife and vegetation.

Impervious Overlay Zoning:

This type of zoning allows your community to limit the amount of future impervious cover. This limit is directly related to the amount of estimated future impervious cover. Site development proposals are reviewed with an imperviousness cap in mind. Subdivision layout options conform to the total impervious limit of the planning area. Developers must use BMPs to reduce overall impervious cover from their site.

Questions to consider before implementing any zoning practice:

1. What are the most economically and politically acceptable zoning techniques that can be used in this community to reduce impervious cover within the subwatersheds?
2. How accurate are our estimates of future impervious cover?
3. Will an increase in impervious cover have negative effects on the watershed?
4. Which watersheds are capable of handling future growth and increases in impervious cover? Which are not?

Use of Natural Features and Source Control for Stormwater Management

This Includes:
- Vegetated buffers and filter strips
- Vegetated channels (i.e. grassed channels, open channels)
- Bioretention ponds and rain gardens
- Infiltration trenches and leaching chambers
- Rooftop run-off reduction mitigation (i.e. green roof, cistern, dry well)
- Stream daylighting for redevelopment projects

How to Use these Practices:
- Implement these practices before, during and after construction
- Direct run-off towards buffers using sheet flow and natural depressions for stormwater storage
- Use these practices in place of underground storm sewers or open concrete channels
- Use natural depressions to provide storage and detention for stormwater flows
- Direct run-off from rooftops to pervious areas
- Use green roof tactics
- Implement vegetated open channels or dry swales in street rights-of-way to

Why Use these Practices?
- Filters and infiltrates stormwater run-off and reduces pollutant loads (i.e. phosphorus)
- Reduce the cost of road and storm sewer construction
- Stormwater travel times increase and peak discharges are decreased
- Break up of impervious cover allows better infiltration and treatment
- Landscaping and stormwater treatment are combined
- Increases recharge to groundwater
- Helps to maintain the site's natural hydrology
- May increase property values

*Underground sand filters and perimeter sand filters are rarely suitable for stormwater treatment in rural and residential settings.

Filter Strip

Grassed filter strips can also be called grassed filters, vegetated filter strips and filter strips. They are designed to treat sheet flow, meaning that run-off must be evenly distributed across the filter strip. Pollutants such as phosphorus are removed via filtration and infiltration through the vegetation and underlying soils. This practice can be especially useful when designing for impervious cover disconnection in residential areas. This practice is defined as having the capacity to remove up to 40% of the total phosphorus that passes through it by the New York State Stormwater Management Design Manual (April, 2008).

Grassed Channel

Grassed channels are less expensive to install and maintain than curb and gutter systems. They should be designed to filter run-off and meet velocity targets of the two-year storm event design criteria. This practice can be especially useful when designing for impervious cover disconnection in residential areas. This practice is defined as having the capacity to remove up to 40% of the total phosphorus that passes through by the New York State Stormwater Management Design Manual (April, 2008).

Bioretention Area

Bioretention areas, also known as rain gardens, are shallow landscaped depressions that are used to capture and treat run-off. They are often used in parking lot islands and residential lawns. Capital and maintenance costs are moderate. This practice is defined as having the capacity to remove up to 80% total suspended solids and 40% of the total phosphorus that passes through by the New York State Stormwater Management Design Manual (April, 2008). They are also able to remove metals like cadmium, copper, lead and zinc and pathogens such as coliform, streptococci and E. coli. The use of native plans in this area is highly recommended.

Open Channel

Open Channels are designed to only capture and treat stormwater by means of dry or wet cells. They are low in capital and maintenance costs. There are two types of open channels; dry swales and wet swales. Dry swales are designed to hold stormwater run-off and facilitate filtration into the soil. Wet Swales are designed to catch groundwater for water quality treatment. This practice is defined as having the capacity to remove up to 40% of the total phosphorus that passes through by the New York State Stormwater Management Design Manual (April, 2008). They are also able to remove metals like cadmium, copper, lead and zinc. This practice is highly recommended for stormwater treatment in colder climates.

Characteristics of Vegetation used for Stormwater Treatment
Tolerant of site-specific and climatic conditions
Non-invasive
Tolerant of typical stormwater pollutant concentrations
Can uptake, store or remove pollutants
Easy to establish and resilient to stress
Low maintenance requirements
Salt-tolerant in areas with high concentrations of soluble salts or cold climates where deicing agents are used
Aesthetically pleasing; attracts birds and provides visual interest
Readily available

This information is adapted from Tables 10.4 and 10.5 in the NYS Stormwater Management Design Manual (April, 2008).

General Design Considerations for Vegetated Systems
Preserve existing natural vegetation whenever possible
Diversify plant species to improve wildlife habitat and minimize ecological succession
Situate plants to allow access for future maintenance
Avoid plants that may overpopulate or become too dense
Use seed mixes with fast germination rates under local conditions
Plant vegetation and seeds at the appropriate time of year
Temporarily divert flows from seeded areas until vegetation is established
Plant stream and water buffers with trees, shrubs, grass and herbaceous vegetation to stabilize banks and provide shade

This information is adapted from Tables 10.4 and 10.5 in the NYS Stormwater Management Design Manual (April, 2008).

Cold Climate Design Guidance

Table 7.3b Watershed/Regional Selection Matrix-2			
SMP Group	**Reservoir**	**Estuary/Coastal**	**Cold Climates**
Ponds	Encourage the use of a large permanent pool to improve sediment and phosphorous removal. Promote long detention times to encourage bacteria removal.	Encourage long detention times to promote bacteria removal. Provides high nitrogen removal. In flat coastal areas, a pond drain may not be feasible.	Incorporate design features to improve winter performance.
Wetlands			Encourage the use of salt-tolerant vegetation.
Infiltration	Provide a separation distance from bedrock and water table Pretreat runoff prior to infiltration practices.	OK, but provide a separation distance to seasonally high groundwater. In the sandy soils typical of coastal areas, additional pretreatment may be required (See Section 6.3.3)	Incorporate features to minimize the risk of frost heave. Discourage infiltration of chlorides.
Filtering Systems	Excellent pretreatment for infiltration or open channel practices. Moderate to high coliform removal	Moderate to high coliform removal Designs with a submerged filter bed appear to have very high nitrogen removal	Incorporate design features to improve winter performance.
Open Channels	Poor coliform removal for wet swales.	Poor coliform removal for grass wet swales.	Encourage the use of salt-tolerant vegetation.

Green Roofs & Walls

The construction of a green roof consists of adding soil and vegetation to the top of a flat or slightly sloped roof. The vegetation detains rainwater and allows for filtration, infiltration, and evaporation. This reduces the amount of stormwater run-off received by surrounding areas and bodies of water. There are two basic types of green roofs: extensive and intensive. Extensive roofs have shallower soil depths than intensive roofs. They typically weigh less and have lower capital and maintenance costs. Intensive roofs have deep soil layers and a lot of vegetation, including trees. Intensive type green roofs usually have pedestrian access.

Why Implement this Practice?

- Helps reduce total run-off volume
- Replaces the vegetative footprint that was lost
- Moderate building temperatures and provide insulation for hot/cold weather
- Reduces energy costs
- Reduces HVAC infrastructure requirements
- Decrease construction costs
- Protects rooftop materials and extends life of roof
- Provides noise insulation
- Can provide fire resistance and reduce the spread of fire from other buildings
- Creates habitats for birds and butterflies
- Can be aesthetically pleasing
- Provides access to scenic space in urban environments
- Reduces the effect of urban "heat islands"

Source: www.pink-to-green.blogspot.com

Green Roof Sizing and Design Guidance:

The following sizing guidelines were compiled using the New York Unified Stormwater Sizing Criteria that is outlined in the New York State Stormwater Management Design Manual (April, 2008). This manual can be found on the NYSDEC website at: http://www.dec.ny.gov/docs/water_pdf/swdmnysswmdm.pdf.

Water quality volume is related to the area of impervious surface on the development site. The first equation was developed so that the practices will be able to treat 90% of the average annual stormwater run-off volume. Consult the New York State Stormwater Management Design Manual (April, 2008) for variable P, 90% rainfall event number, for the area of NYS you are working in. Greene County is between 1.0 and 1.2.

Where:

$WQ_V = (P)(0.05 + 0.009(I))(A)/12$

$WQ_V \leq V_{SM} + V_{DL} + (D_P + A_{GR})$

$V_{SM} = A_{GR} \times D_{SM} \times n_{SM}$

$V_{DL} = A_{GR} \times D_{DL} \times n_{DL}$

WQ_V = Water Quality Volume, ft^3
P = 90% Rainfall Event Number
I = percent impervious cover
A = contributing site area, ft^2
V_{SM} = volume of the soil media, ft^3
V_{DL} = volume of the drainage layer, ft^3
A_{GR} = green roof surface area, ft^2
D_P = depth of ponding above surface, ft
D_{SM} = depth of soil media, ft
D_{DL} = depth of drainage layer, ft
n_{SM} = porosity of the soil media, ~20%
n_{DL} = porosity of the drainage layer, ~25%

Residential Bioretention Area Design Criteria

The following sizing guidelines were compiled using the New York Unified Stormwater Sizing Criteria that is outlined in the New York State Stormwater Management Design Manual (April, 2008). This manual can be found on the NYSDEC website at: http://www.dec.ny.gov/docs/water_pdf/swdmnysswmdm.pdf.

Water quality volume is related to the area of impervious surface on the development site. The first equation was developed so that the practice will be able to treat 90% of the average annual stormwater run-off volume. Consult the New York State Stormwater Management Design Manual (April, 2008) for variable P, 90% rainfall event number, for the area of NYS you are working in. Greene County is between 1.0 and 1.2.

Where:

$WQ_V = (P)(0.05 + 0.009(I))(A)/12$

$WQ_V \leq V_{SM} + V_{DL} + (D_P + A_{GR})$

$V_{SM} = A_{GR} \times D_{SM} \times n_{SM}$

$V_{DL} = A_{GR} \times D_{DL} \times n_{DL}$

WQ_V = Water Quality Volume, ft^3
P = 90% Rainfall Event Number
I = percent impervious cover
A = contributing site area, ft^2
V_{SM} = volume of the soil media, ft^3
V_{DL} = volume of the drainage layer, ft^3
A_{GR} = rain garden surface area, ft^2
D_P = depth of ponding above surface, ft
D_{SM} = depth of soil media, ft
D_{DL} = depth of drainage layer, ft
n_{SM} = porosity of the soil media, ~20%
n_{DL} = porosity of the drainage layer, ~25%

Source: www.epa.gov

Design Considerations:
- Native vegetation should be used as much as possible
- Rain gardens require flat slopes and should be located 30 feet from the impervious area to be treated
- Compacted clay soils will need more attention than other soils
- Locate bioretention areas where tree cover is minimal because root systems can make installation difficult
- Ponding above the bioretention area should not exceed 6 inches
- Surface area should not exceed a loading ration of 5:1 drainage area to infiltration area
- Length to width ratio should be 2:1, with the long axis perpendicular to the flow path of the stormwater

Hunter Corridor Regional Planning Study

Better Site Design Tool Kit

For
Greene County Residents

Lawn Chemicals

Helpful Hints:
- Get a soil test before fertilizing
- Avoid using unnecessary amounts of pesticides and fertilizers
- Do not fertilize your lawn right before a storm. Heavy rains can wash chemicals away with stormwater and end up in lakes and streams
- Avoid getting fertilizer on impervious surfaces where it is most likely to wash away with runoff
- Do not pour chemicals down storm drains or near rivers and lakes
- Make sure you are using the right product at the right time
- Store chemicals properly, according to instructions

Use the tables below to rate your lawn care practices

Yard & Garden Care				
	LOW RISK	MEDIUM RISK	HIGH RISK	RATE YOUR LAWN
Fertilizers	Soil is tested and proper fertilizer is used	Soil is tested, but more/wrong fertilizer is used	Soil is not tested and the fertilizer used is unknown/excessive	
Pesticides	Non/low chemical methods are used to control pests	Chemicals are used according to instructions	Pests are not identified and chemicals are used without consulting instructions	
Composting	Well maintained compost pile	Poorly maintained compost pile	Compost pile is poorly maintained and located <50 feet from a well or surface water	
Water Requirements of Plants	Vegetation is able to survive with normal rainfall	Plants require light/moderate watering	Heavy watering is required to keep vegetation alive	
Water Methods	Water from 2am-9am as needed	Excessive watering, water lands on pavement instead of grass	Watering is done during hottest part of the day, excessive runoff	

Yard & Garden Care		
Write all high and medium risks associated with your lawn below.	What can you do to reduce the risk?	Set a target date for action...
Example: applied fertilizer to soil even though soil has never been tested.	Find a laboratory that will test your soil and send them samples.	One week from today: April 2

Source: University of Missouri, Columbia

Old Fashioned Rain Barrels
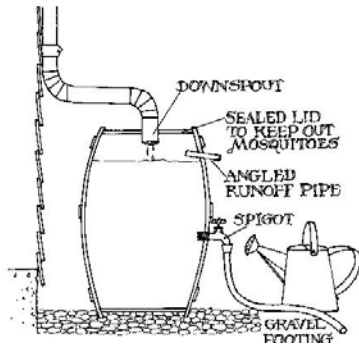
A rain barrel connected to your downspout or drainage system will allow you to collect rainwater and store it for later use. This water is better for plants than the water pumped from your system. It does not contain chemicals like fluoride and chlorine. Simple practices like this can greatly reduce stormwater runoff which contributes to pollution of local lakes and streams.

If you do not wish to use this practice or one similar, try diverting rooftop runoff to the least impervious area of your lawn.

Rethink Grass Clippings

Grass clippings and leaves naturally contain nitrogen and phosphorus. When they are left at the curb for pick up nutrients get washed away, ultimately ending up in lakes and streams. The debris can even clog drains and contribute to local flooding. Try mowing your grass often enough so clippings can be left on the lawn or add the clippings to your compost pile. Here they can serve as a fertilizer.

Tree Conservation & Planting

Planting or conserving trees on a construction site or lawn can:
- Reduce stormwater runoff
- Increase nutrient uptake, i.e. phosphorus
- Provide bank stabilization, i.e. erosion control
- Provide shading and wildlife habitat
- Reduce construction, maintenance, and mowing costs
- Decrease heating and cooling costs

Trees & Energy Conservation:

"Planting trees around your home will conserve energy and lower the cost of utility bills. Three well-placed deciduous (leaf-losing) trees on the east, south, and west sides of a home will shade it from summer sun and lower air conditioning costs by 10 to 50 percent. In addition to saving money, conserving energy directly translates to less carbon dioxide produced at the power plants."[1]

---

[1] *How to Plant a Tree*. Retrieved November 23, 2009, from the American Forests website: http://www.americanforests.org

What does Composting have to do with Stormwater?

Compost is a combination of decaying vegetation and organic materials such as grass clippings, leaves, and food scraps. The vegetation is aerobically digested by bacteria to produce natural mulch and fertilizer. Composting helps reduce the amount of nitrogen and phosphorus released to the environment by yard wastes.

Benefits:
- Compost releases nutrients slowly
- Helps create healthy soils and plants
- Yard vegetation is less likely to succumb to pest infestation
- Easy and practical way to reduce the amount of waste in landfills
- Reduces household waste up to 30%
- Inexpensive alternative to peat and other soil improvers

What Can I Compost?
- Grass clippings (free of lawn chemicals)
- Fallen leaves
- Weeds
- Food scraps (NOT: meat, fish, bones, fatty foods)
- Chipped or shredded wood
- Pet hair
- Coffee grounds
- Cardboard, cotton swabs, and brown paper bags
- Leather wallets

Source: www.cwmi.css.cornell.edu

Additional Resources:
- Resource Conservation: http://www.epa.gov/osw/conserve/rrr/composting/
- Composting at Home: http://www.dec.ny.gov/chemical/8799.html
- Cornel Waste Management Institute: http://cwmi.css.cornell.edu/composting.htm
- Compost Facilities: http://www.dec.ny.gov/docs/materials_minerals_pdf/compweb.pdf

Rain Gardens

A rain garden is a small bioretention area used to treat stormwater runoff. They are usually located in parking lots or residential lawns and resemble landscaped depressions. Runoff from impervious cover is directed to the rain garden where it percolates through an underground filter system. The area should be filled with plants that are both aesthetically pleasing and well suited to be periodically flooded with water. This practice should be applied to shallow slopes.

Use a grass channel or filter strip to ensure your pretreatment will perform adequately. The clay soil found in Greene County does not allow for much infiltration. The clay soil should be excavated and replaced with a soil bed containing a sand and soil matrix with a mulch layer above it. The rain garden should be designed to pond 6-9" of water above the filter bed. Stormwater should be conveyed to and from this practice safely and in such a way that erosion is minimized. Use native vegetation where possible and select a combination of trees, shrubs and herbaceous plants.

Bioretention areas can be expensive to implement. These are areas that would normally be landscaped anyways. Maintenance costs are very similar to costs associated with maintaining normal landscaping. The following equation, developed by Brown and Schueler (1997) (www.stormwatercenter.net), can be used to estimate the cost of your rain garden:

$$C = 7.30V^{0.99}$$

Where: C is the construction, design, and permitting cost
V is the volume of water to be treated, ft^3

Additional Practices to Review

The following practices will reduce the total amount of phosphorus found in stormwater:

1. Parking lot and street cleaning

   a. EPA Fact Sheet:

      http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&Rbutton=detail&bmp=99

   b. California's Best Management Practices Handbook: http://ww
      w.cabmphandbooks.com/Documents/Municipal/SC-70.pdf

2. Road salt application and storage

   a. EPA Fact Sheet:

      http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet_results&view=specific&b
      mp=106

   b. American Association of State Highway and Transportation: http://www.transportation.org/

3. Roadway and bridge maintenance

   a. http://www.epa.gov/OWOW/NPS/education/planroad.html

4. Pet waste collection

5. Litter Control

6. Proper waste disposal

   a. Waste Reduction: http://www.dec.ny.gov/chemical/8502.html

   b. Reuse and Recycling: http://www.dec.ny.gov/chemical/8510.html

7. Equipment and vehicle cleaning

8. Road kill composting

Better Site Design Measurable Goals

Use this document to help measure the progress of the BSD practices that have been implemented in your community. It should help identify which practices are working and which ones need to be re-evaluated.

1. Alternative Turnarounds
   a. Was there a reduction in overall impervious cover due to the implementation of alternative turnarounds?
   b. What is the number of turnarounds modified?
   c. Were codes changed to allow alternative turnarounds?
   d. Was there a reduction in runoff quantity associated with turnarounds?

2. Bioretention
   a. Was there a reduction in impervious cover as a result of the implementation bioretention areas/rain gardens?
   b. Was there a reduction in runoff quality and quantity associated with bioretention areas/rain gardens?
   c. How many new bioretention areas/rain gardens were installed?

3. Inspection and Maintenance
   a. What is the frequency of inspection and maintenance of BSD practices?
   b. How many problems were identified and fixed in a timely manner?
   c. Was there a change in the number of BMPs that are well-maintained as a result of inspections?
   d. Were there any changes in effluent water quality resulting from BMP inspections?

4. Buffer Zones
   a. Were codes changed to encourage or require buffer zones?
   b. How many acres of land were conserved by buffers?
   c. How many acres of land drain to buffer zones?
   d. Were there any changes in water quality of runoff leaving buffer areas?
   e. Were there any changes in physical characteristics of water downstream from buffer zone areas?
   f. What is the frequency of inspection and maintenance in buffer zones?

5. Catch Basins
   a. Is there a completed inventory of catch basins?
   b. How many catch basins were retrofitted with filtering devices?
   c. What is the quantity of sediment removed from catch basins

6. Conservation Easements
   a. How many acres of land are conserved under easements?
   b. Is there a completed inventory of land that could be conserved?

7. Dry Extended Detention Ponds
   a. Was there a reduction in runoff quality due to dry extended detention ponds?
   b. Were there any changes in water quality of effluent from the dry pond outlet?
   c. How many new dry ponds were installed?
   d. How many acres of land are drained by dry ponds?

8. Eliminating Curbs and Gutters
   a. Were development codes changed to eliminate curbs and gutters?
   b. Was there a reduction in runoff quantity due to a decrease in curbs and gutters?
   c. How many new developments were designed without curbs and gutters?

9. Grassed Swales
   a. How many new grassed swales were installed?
   b. How many miles of street have grassed swales?
   c. Was there a reduction in runoff quantity and velocity as a result of grassed swales?
   d. How many acres are drained by grass swales?

10. Grassed Filter Strips
    a. How many new grassed filter strips were installed?
    b. How many miles of streets exist with grassed filter strips?
    c. How many acres are drained by grass filter strips?
    d. Was there a reduction in runoff quantity and velocity as a result of grassed filter strips?

11. Green Parking
    a. Were development codes changed to allow green parking?
    b. How many green parking lots were installed?
    c. Was there a reduction in runoff quantity?
    d. How many impervious acres are served by green parking?
    e. How many impervious lots were converted to green parking?

12. Infiltration Basins
    a. Was there a reduction of runoff quantity as a result of the performance infiltration basins?
    b. Were there any changes in water quality as a result for infiltration basins?
    c. How many new basins were installed?

13. Infiltration Trenches
    a. Was there a reduction of runoff quantity as a result of infiltration trenches?
    b. Were there any changes in water quality as a result of infiltration trenches?
    c. How many new infiltration trenches were installed?

14. Narrower Residential Streets
    a. Were development codes modified to allow narrower streets?
    b. Was there a reduction of impervious surfaces due to the narrowing of streets?
    c. How many new developments use narrower streets?
    d. How many miles of narrow roadway exist?

15. Open Space Design
    a. Were development codes modified to accommodate open space developments?
    b. How many new developments use open space principles?
    c. How many acres of open space are preserved with open space design?

16. Stormwater Wetland
    a. Were there any changes in water quality as a result of stormwater wetlands?
    b. Was there a reduction in runoff quantity as a result of stormwater wetlands?
    c. How many stormwater wetlands were created?
    d. How many acres of impervious surface drain to new stormwater wetlands?

17. Tree Planting
    a. Were development codes modified to promote planting and conservation of trees?
    b. How many trees were planted as a result of forestry initiatives?
    c. Was there a reduction in runoff quantity as a result of an increased number of trees?
    d. Were there changes in water quality as a result of increased number of trees?

18. Wet Ponds
    a. Were there any changes in water quality as a result of wet ponds?
    b. Was there a reduction in runoff quantity as a result of wet ponds?
    c. How many wet ponds were installed?
    d. How many acres of impervious surface drain to newly implemented wet ponds?

Use and Implementation of Stormwater Credits

The concept of Stormwater Credits is being introduced to the Town of Hunter, Village of Hunter, and Village of Tannersville to provide developers and site designers an incentive to implement Better Site Design practices. Stormwater Credits are a way to quantify non-structural stormwater practices to help achieve compliance with specific stormwater criteria. These practices reduce the volume of stormwater runoff and minimize the pollutant loads. Using these practices allows developers and designers to fully recognize improvements associated with water quality and quantity.

There is a minimum set of criteria for each specific Stormwater Credit. Some of these credits may be restricted by the communities because of local safety codes, soils conditions, and topography. Use the NYS Stormwater Management Design Manual (April 2008) as a guide when planning for Stormwater Credits.

The use of credits should be documented starting at the initial site design phase. "Stormwater Credit Computation Forms" need to be completed to apply for each credit. The separate communities may wish to decide on and execute Stormwater Credits that best meet their resource protection needs.

Stormwater Credit Capability to Comply with NYS Stormwater Management Criteria				
Stormwater Credit	**NY Stormwater Criteria**			
	Water Quality (WQ_v)	Channel Protection (Cp_v)	Overbank Flood (Q_p)	Extreme Flood (Q_f)
Credit 1: Natural Areas Conservation	High	Medium	Low	Low
Credit 2: Stream & Wetland Buffers	High	High	Low	Low
Credit 3: Vegetated Open Channels	High	Medium	Low	Low
Credit 4: Overland Flow to Groundwater Recharge Zones	High	Medium	Low	Low
Credit 5: Environmentally Sensitive Rural Development	High	Medium	Medium	Medium
Credit 6: Riparian Reforestation	High	Medium	Low	Low

High = credit will generally provide a high capability to meet the criterion by reducing the impervious cover used in the WQ_v calculation and channel protection volume

Medium = credit will generally provide a medium capability to meet the criterion through reducing the runoff curve number and creating a longer time-of-concentration which will reduce post runoff rates and volumes

Low = credit will generally provide a low capability to meet the specified criterion because disconnected impervious cover does not allow for a reduced runoff curve number for larger storm events

Credit 1, Natural Area Conservation, requires that undisturbed natural areas be permanently conserved on a site. The conservation area must be a minimum of 10,000ft^2. Credit 2, Stream and Wetland Buffers, is granted when runoff is effectively treated by a stream or wetland buffer. The property owner must have sole control of this buffer. Some sites may be too steep to implement this credit. Credit 3, Vegetated Open Channels, can only be applied to moderate or low density land uses. Credit 4, Overland Flow Filtration to Groundwater Recharge Zones, can be achieved by grading the site to promote overland vegetative filtering, by providing infiltration, and implementing rain gardens. The impervious flow path must be less than 75 feet in length. Credit 5, Environmentally Sensitive Rural Development, can be applied when a number of Better Site Design practices are applied to low density development projects. Lot sizes need to be at least one acre, unless a cluster design is being used. Credit 6, Riparian Reforestation, is taken when impervious areas are effectively disconnected to drain through the reforested buffer. See the NYS Stormwater Management Design Manual for more details.

Better Site Design Site Plan Review Checklist

Use the customized application that was created for your community using Arc Explorer Java Edition for Education to help with this evaluation.

Project Name: _____
Address: _____
Parcel Number(s): _____
Site Owner/Developer: _____
Contact Person: _____
Phone number: _____ Email: _____

Project Type: Check all that apply

    ___ New Development   ___ Mix of New and Redevelopment
    ___ Redevelopment   ___ Planned Unit Development
    ___ Commercial   ___ Cluster Subdivision
    ___ Residential   ___ Other (describe):

Project Description: _____

_____

_____

SEQR Action: ___ Unlisted   ___ Type I   ___ Type II

BSD Measures: Document the Better Site Design practices that are being considered for the planning and design of the project. Check the boxes below as appropriate. Mark categories NA if not applicable.

   ___ Reduces Impervious Cover and Directly Connected Impervious Areas
       ___ Uses minimum pavement dimensions (cul-de-sac, street, sidewalk, etc.)
          ___ Uses traffic analysis to estimate average daily trips and determine minimum dimensions of the roadway needed for safety
       ___ Implements reduced building footprint
       ___ Implements shared driveways
       ___ Uses reduced front/side/rear yard setbacks
       ___ Includes landscaping plans with native vegetation
       ___ Other (describe):

Better Site Design Site Plan Review Checklist

Type of Impervious Cover	New Area (ft^2)	Existing Area (ft^2)

Number of Parking Spaces: _____

                  existing   proposed   total

No. of Residential Units: _____

                  existing   proposed   total

Total Site Area = _____ Acres

Total Open Space = _____ Acres; _____ % of total land

___ Can a Density Bonus be implemented?

___ Plan delineates Natural Conservation Areas and other areas of importance

___ Minimizes Disturbance of Natural Features
      ___ Drainageways   ___ Streams and Water Courses
      ___ Topography   ___ Natural Slope and Grade
      ___ Floodplains   ___ Stream Buffers
      ___ Wetlands   ___ Other (describe):
      ___ Forests

___ Uses Natural Features for Source Control
      ___ Vegetated Buffer   ___ Bioretention and Rain Gardens
      ___ Tree Planting   ___ Vegetated Channels
      ___ Green Roof   ___ Other (describe):

Better Site Design Site Plan Review Checklist

___ Runoff diverts to the least impervious areas on site

___ Proposes an adequate, long-term stormwater maintenance agreement

___ Proposes and erosion and sediment control plan

___ Appropriate permit standards have been recognized and considered in the design
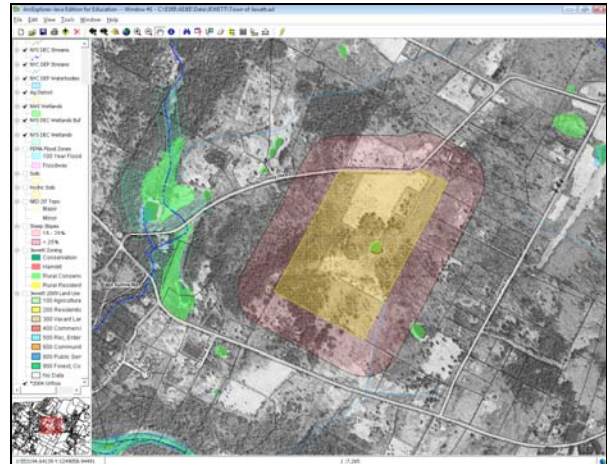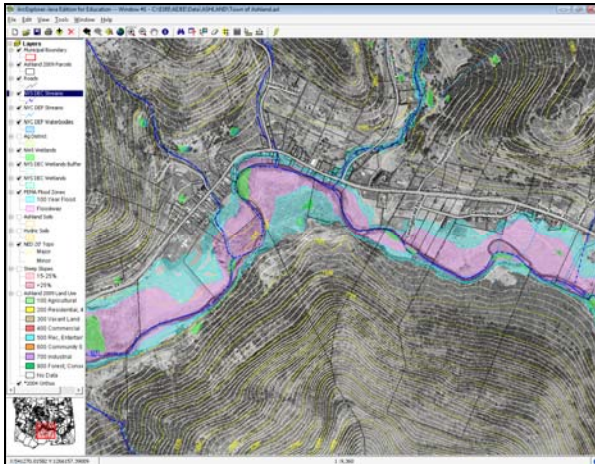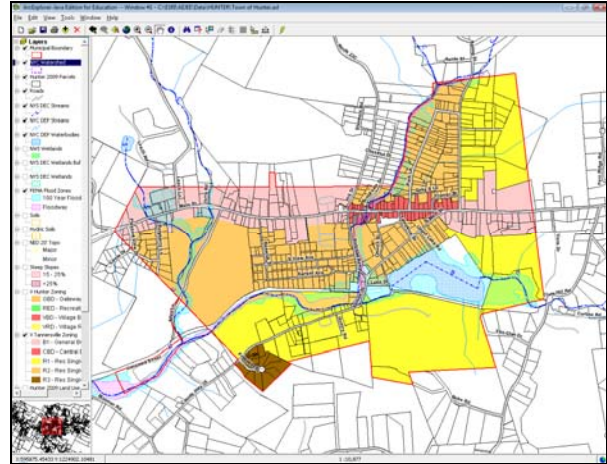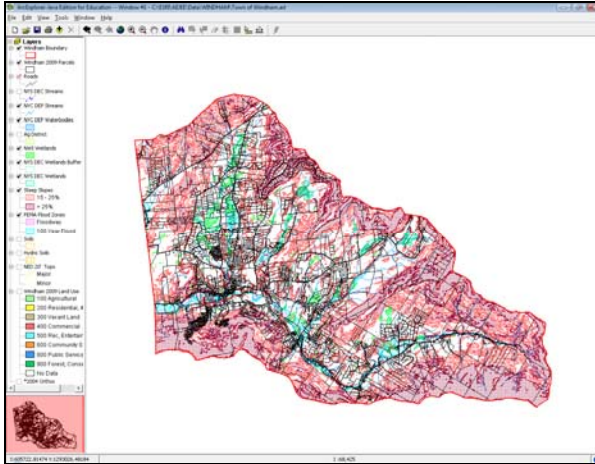
___ BSD techniques implemented meet stormwater objectives

___ Selected practices are appropriate for the site

___ All aspects of the site plan conform to the laws and ordinances set forth by: The Town/Village of _____

Notes:

Greene County
Mountain Top Mapping Application

User Guide

GREENE COUNTY DISCLAIMER

The Geographic Information Systems data and computer software available on the Greene Co. Mountain Top Mapping Application CD (hereinafter referred to as the "Mapping CD") are provided on an "As Is", "As Available" and "With All Faults" basis. Neither Greene County nor any of its officials and employees (hereinafter collectively referred to as "Greene County") makes any warranty of any kind for this information, express or implied, including but not limited to any warranties of merchantability or fitness for a particular purpose, nor shall the distribution of this information constitute any warranty.

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Regarding all GIS data obtained from NYCDEP, the user(s) specifically agrees to the following terms and conditions governing any access to and use of the data:

1. The data are not for resale or redistribution either electronically or in printed format other than in reports or analyses citing the New York City Department of Environmental Protection as the primary source and custodian of the data. Such data shall be used only for lawful purposes.

2. The New York City Department of Environmental Protection (DEP) does not guaranty or warranty the accuracy of such data, and is not liable for any damages, direct or indirect, sustained as a result of the use of, or reliance upon, any of such data. The metadata file for each coverage should be reviewed to understand the sources and limitations of the data. The sources and limitations of the data (including any limitations on the accuracy thereof) should be taken into account before using them in any analysis.

3. DEP is not liable for any misuse or misrepresentation of such data by the user(s) or by any other party.

4. DEP reserves the right to periodically update or change such data, without notice, and is not liable to the user(s) or any other party on account of any such update or change.

Note: Metadata files for the Greene Co, CSCIC, NYCDEP and NYSDEC layers are included on the Mapping CD.

TABLE OF CONTENTS

GREENE COUNTY
MOUNTAIN TOP MAPPING APPLICATION

USER GUIDE

1.   INTRODUCTION

Greene County Planning and Economic Development received a NYS Department of State grant to fund an innovative regional mapping project for the nine Mountain Top communities. The focus of the project is to assist communities in the review of development projects from a water quality perspective. A custom mapping application has been created for each community that overlays parcel boundaries, environmental layers (streams, wetlands, waterbodies, flood zones, soils, topography, steep slopes), land use, zoning districts and aerial photos. This application will help Planning Boards and local officials view and analyze environmental data in order to make sound decisions during the project review process. Each community will receive a CD containing the installer program, the municipality's custom mapping application, data files and instruction manuals.

The mapping application was created using ArcExplorer Java Edition for Education (AEJEE). AEJEE is a free entry level geographic information system (GIS) program for viewing and interpreting geographic data. It was originally designed by Environmental Systems Research Institute (ESRI) for use in the education community, but may be freely distributed if the original installer, license agreement and data files are provided to the user. Both Windows and Mac versions of the AEJEE installer and custom applications are included on the CD. Although AEJEE is much simpler than full-featured GIS applications in ESRI's suite of products, it is a surprisingly powerful program.

This User Guide will give an overview of the basic functions of AEJEE and the tools that Planning Boards will find most helpful during project review. For more detailed instructions, please refer to the *AEJEE User Manual* which is included on the CD and linked to the program's Help Menu.

2.   INSTALLING AEJEE

Insert the Mountain Top Mapping CD and copy all the files to an easily accessible folder on your computer. Uncompress the appropriate installer for your computer (**aejee_232_windows.zip** or **aejee_232_mac.zip**) using software such as WinZip for PC or StuffitExpander for Mac. Newer Macs running Boot Camp or Parallels software will be able to run the AEJEE Windows version.

A. Windows Version

1. Double click on **install.exe** and follow the instructions until the installation is complete. It is important to accept the default location for installation (**C:\ESRI\AEJEE**).

   (Note: AEJEE was last updated in 2007 and does not support some of the features in more recent Windows operating systems. If you are running Windows VISTA or Windows 7, you must run the installer in Compatibility Mode. Right click on the install .exe file and bring up the properties box. Click on the Compatibility tab and check "Run this program in compatibility mode for:" and pick Windows XP Service Pack 2 or 3 in the drop down box. Click Apply and OK and close the properties box.)

2. The Installer creates an ESRI folder in your C drive which contains the AEJEE files. Open **C>ESRI>AEJEE>Data**. Place your Town's data folder from the CD into this Data folder so the AEJEE application can find it.

3. You may want to create an easily accessible desktop shortcut for AEJEE. Click on **Start>Programs>AEJEE** folder. Right click **AEJEE** 🌐 globe icon and copy and paste a shortcut to your desktop.

B. Mac OS X Version

1. Double click on the **Install** icon and follow the instructions until the installation is complete. Accept the default location for installation (**Hard Drive/ESRI/AEJEE**).

2. The Installer creates an ESRI folder on your hard drive which contains the AEJEE files. Open **Hard Drive>ESRI>AEJEE>Data**. Place your Town's data folder from the CD into this Data folder so the AEJEE application can find it.

3. You may want to create an easily accessible desktop icon for AEJEE. Open **Hard Drive>ESRI>AEJEE**. Drag the **AEJEE** globe icon to your Dock or desktop.

You will note that the Installer program also created numerous .axl files and folders within the AEJEE Data folder. These are projects and data for the lessons contained in the AEJEE User Manual which is included on the CD and linked to the Help Menu in the program. The adventuresome who want to fully explore the capabilities of AEJEE can print out this manual and follow the lesson plans.

3.   STARTING AEJEE

A. Windows Version

To launch AEJEE double click your new AEJEE desktop icon or click **Start>Programs> AEJEE** folder**>AEJEE** icon. The ArcExplorer window will open with a blank screen.

Note: If you are running Windows 7 you will need to run the program in Compatibility Mode. Right click on the AEJEE icon and bring up the properties box. Click on the Compatibility tab and check "Run this program in compatibility mode for:" and pick Windows 2000 in the drop down box. Click Apply and OK and close the properties box.

If you are using Windows XP or Windows 7 you may see a message that the color scheme has been changed temporarily. Your screen will flash off and on as the display changes.

B. Mac OS X Version

To launch AEJEE double click the AEJEE icon in the Dock or on your desktop, or navigate to Hard Drive>ESRI>AEJEE folder>AEJEE icon. A blank ArcExplorer window will open.

Note: The default Mac OS X icons and menu bars look very different from the Windows version. If you want the icons to match those illustrated in this guide go to the Menu Bar and click on Window>Look and Feel>Metal.

Maximize the AEJEE window (use the maximize button in the upper right hand corner of the Windows window or the green button in the upper left hand corner of the Mac window.) This will help avoid any error messages when you open the map, and help you see the most map details.

Click on **File>Open>YOUR TOWN> Your Town.axl**. The custom application for your

municipality will load in the AEEE window.

The AEJEE window has several main parts:

1.   The **Menu Bar** across the top with drop-down commands

2.   The **Tool Bar** underneath the Menu Bar

3.   The **Table of Contents** listing available layers on the left

4.   The **Map Window** on the right

5.   The **Status Bar** at the bottom, showing the cursor coordinates and map scale

6.   A small **Overview Map** can be turned on at the bottom of the Table of Contents
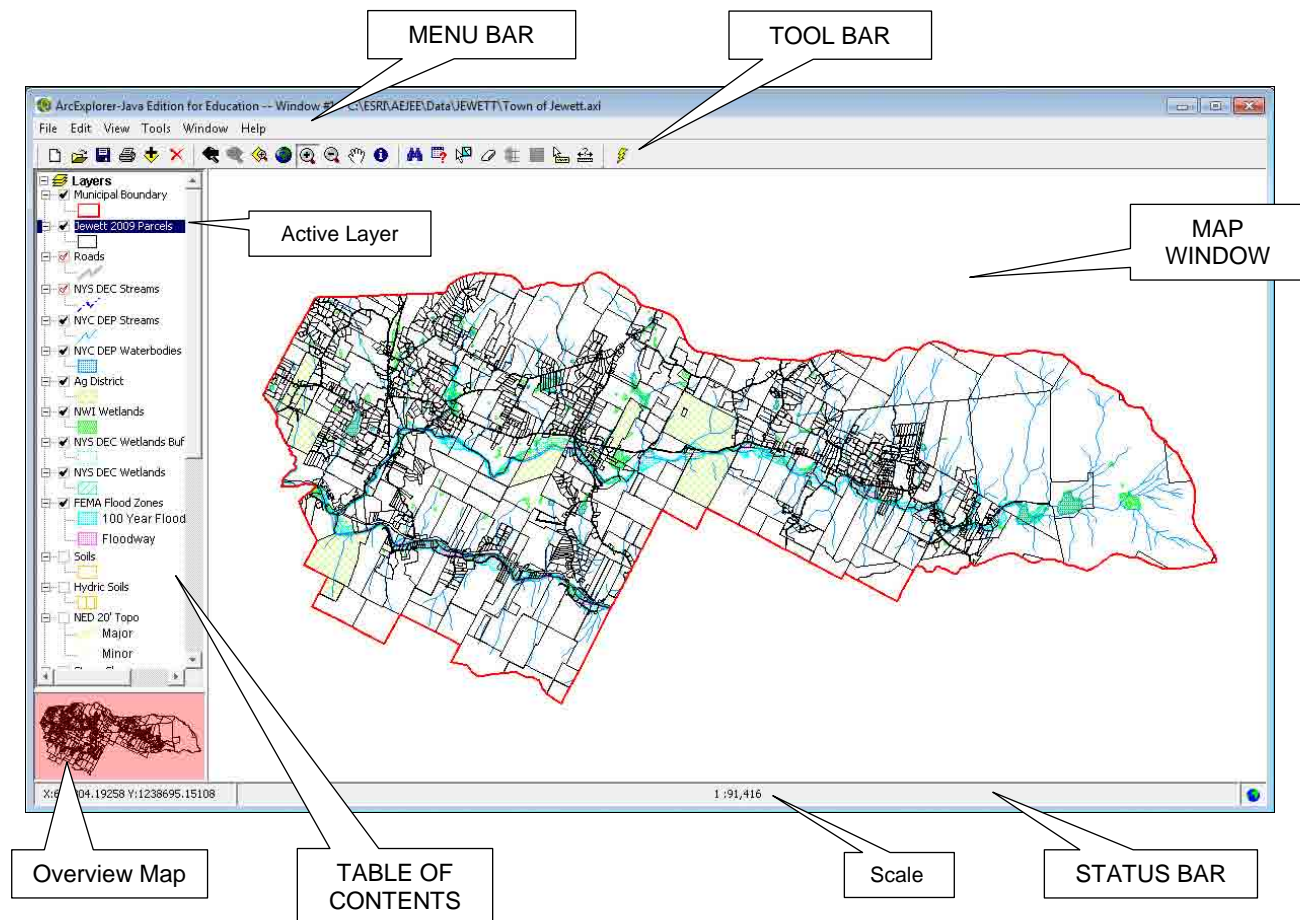
4.   MENU BAR OVERVIEW

This section describes the commands contained in the AEJEE Menu Bars.

A. File Menu

Open – Use this command to open the .axl project for your Town.

Save – Saves the project.

Save As – Saves a copy of the project.

Print – Prints an image of the Map Window.

Export to Image – Produces an image of the Map Window as a .bmp, .jpg or .png file.

Exit – Safely closes the program.

B. Edit Menu

The *Clear Internet Feature Cache* command helps free up memory used when you are accessing GIS data via the internet. Use of Internet data is not covered in this User Guide.

C. View Menu

Map View – Makes the Map Window visible. This is the default setting.

Layout View – Makes the Layout Window visible with tools for producing a printed map page. Creation of Map Layouts is not covered in this User Guide. Please see Lesson 3 in the *AEJEE User Manual* on the CD.

Toolbars – There are three sets of toolbars: Standard, Zoom-Pan and Advanced. The Tools are described in **Section 5**.

Table of Contents – Toggles the Table of Contents on and off. **See Section 6** for more information.

Overview Map – Turns on a small map showing the full geographic extent of your Town below the Table of Contents. This map is helpful for getting your bearings and navigating around the map. Directions for setting up and using the Overview Map are in **Section 7**.

Status Bar – Shows the (x,y) coordinates of the cursor and the map scale at the bottom of the Map Window.

Pan Panel – Turns on a frame around the map window with buttons that allow you to pan north, south, east, or west with a single click.

Map Units – Toggles between feet and meters. Feet is the default unit of measurement.

Zoom to Scale – Zooms to a specific scale. Certain features on the map (such as the aerial photos) will only be visible when you are zoomed in to a threshold scale.

Add Event Theme – Adds points from a table of latitude and longitude coordinates, such as waypoints from a GPS unit. More details are included in **Appendix C**.

D. Tools Menu

Catalog – Select different databases or Internet map servers to add data.

Find – Search for a particular value in a chosen layer. See **Section 12** for instructions.

Query Builder – Develop questions or queries about the data in the form of an equation. See **Section 16** for instructions on using this powerful tool.

Buffer – Build a buffer area around the selected features in the active layer. A pop-up window lets you pick the size and units of the buffer. You can also select the features of another layer that fall within the buffer. See **Section 14** for instructions.

Map Tips – Sets a data field (such as PrintKey for the Tax Map numbers) that will appear when you roll your cursor over the map features. **See Section 8** for instructions.

Projection – The projection of the map is Transverse Mercator, North American Datum 1983 (NAD83) New York State Plane Eastern Zone, US Survey Feet. Do NOT change the projection of the map or the data layers may not line up properly.

E. Window Menu

New Window – Opens a new Map Window.

Look and Feel – Changes the appearance of the windows.

F. Help Menu

Help Contents – Opens the detailed AEJEE User Manual with lesson plans.

Message Console – Opens the Java Console with error messages.

About – gives information about the AEJEE version and copyright.

5.   TOOL BAR OVERVIEW

This section gives a brief description of the tools contained in the AEJEE Tool Bars.

A. Standard Tool Bar

New – Open a new window

Open – Open an AEJEE project .axl file

Save – Save the current project

Print – Print the current window

Add Data – Add data layers to the map

Remove Layer – Remove a selected layer from the map

B. Zoom-Pan Tool Bar

Previous Extent – Zoom to previously viewed extent

Next Extent – Zoom to next viewed extent

Zoom to Active Layer – Zoom to the full extent of the Active Layer (highlighted in dark blue in the Table of Contents.)

Zoom to Full Extent – Zoom to the full extent of the map. This is a good way to reset the view if you have zoomed in too far. It is also wise to start and end your session viewing at full extent.

Zoom In – Click on the button and then drag a diagonal box on the Map Window with your mouse. When you release the mouse, the map will zoom to that area. Alternately, a simply click will zoom in a little bit, centered on where you clicked.

Zoom Out – Click on button and then on the Map Window. The view zooms out a little bit, centered on where you clicked.

Pan – Grab and pan the view in the Map Window.

Identify – Click on a feature in the Active Layer (blue highlighted). A pop-up box will show all the information about that feature in the database.

C. Advanced Tool Bar

Find – Search for a particular value in a chosen layer. See **Section 12** for details.

Query Builder – Develop questions or queries about the data in the form of an equation. See **Section 16** for instructions on using this powerful but complex tool.

Select Features – Select features from the Active Layer by using a rectangle, circle, line or polygon. Choose the type of selection tool and drag/draw on the map. The selected features will be highlighted in yellow. See **Section 13** for full instructions.

Clear All Selection – Clears the highlighted selection you have made.

Buffer – Build a buffer area around the selected features in the Active Layer. A pop-up window lets you pick the size and units of the buffer. You can also select the features of another layer that fall within the buffer. See **Section 14** for instructions.

Attributes – This tool pops up a window that shows the Attribute Table (data) of the selected feature from the underlying database.

Map Tips – Sets a data field (such as Tax Map numbers) that will appear when you roll your cursor over the map features. See **Section 8** for instructions.

Measure – Measure distances on the map by choosing the measurement units and then clicking and dragging a line segment. See **Section 11** for instructions.

Hot Link – Link to a specific file or URL that has been attached to the feature. Hot Links are not used in the Mountain Top Mapping Application.

6.   TABLE OF CONTENTS

A. Included Data Layers

The Table of Contents lists the data layers available to be displayed in the Map Window. Each layer also has a database associated with it. The following layers are included in the application:

- Municipal Boundary
- 2009 Greene County Parcel Boundaries with Real Property Tax Roll data
- Road Centerlines and Names(visible at 1:48,000 scale)
- NYS DEC Streams and Classification (visible at 1:24,000 scale)
- NYC DEP Streams
- NYC DEP Waterbodies
- NYS Certified Agricultural District Parcels
- NWI (National Wetland Inventory) non-jurisdictional Wetlands
- NYS DEC 100' Wetland Buffer
- NYS DEC Wetlands
- FEMA Flood Zones
- National Resources Conservation Service Soil Types (visible at 1:12,000 scale)
- Greene County Hydric Soils
- 20' Topography (created from NED 1/3 arc second DEMs, visible at 1:12,000 scale)
- Steep Slopes (created from NED 1/3 arc second DEMs)
- NYS Owned Land (based on 2009 Greene County Real Property database)
- NYC DEP Land (current as of February 2010)
- Existing Designated Hamlets (originally created in 2001)
- Zoning Districts (if applicable)
- 2009 Land Use (based on Greene County Real Property Class codes)
- 2004 NYS Digital Ortho Imagery (visible at 1:12,000 scale)

Note: The locations of the parcel boundaries and environmental features are APPROXIMATE. While useful for general planning purposes, they must be field verified for regulatory permits. Please see **Appendix A** for more information on the data sources and their limitations.

B. Working with Layers

1. Click on the box to the left of the Layer name to toggle it on or off. If a solid black checkmark appears, the layer will draw on the map. If a red hollow checkmark appears it means that a scale threshold is set and you must zoom in closer to see that layer.

2. Clicking the minus box in the margin collapses the Layer legend, and clicking the plus box expands the Layer legend to show the map symbols.

3. Clicking the name of a Layer selects it as the **Active Layer** and highlights it with a dark blue box. The **Active Layer** is the layer that the selected tool in the Tool Bar acts upon.

4. Right-clicking a selected Layer brings up a menu with the following choices. The choices marked with an asterisk are the ones that you will need to use.

    Add Data – Adds additional layers (only functional if you right-click **Layers**).

    Rename – Permits you to change the name of the layer.

    Remove – Deletes the layer.

    Move Layer – Moves the position of the layer in the Table of Contents. AEJEE draws the layers in the Map Window starting from the bottommost layer in the Table of Contents.

    Attribute Table – Shows the database of information (attributes) for the selected layer.

    Zoom to Layer – Zooms the map to the extent of the selected layer.

    Activate Data Frame – Not sure what this does! It is always grayed out.

    Use in Overview Map – Selects the layer for use in the small Overview Map. See **Section 7** for directions on setting up the Overview Map.

    Properties – Pops up a window that lets you control how a layer is displayed including symbols, labels, projection, and the threshold display scale. You should not have to change any of these values.

7.   USING THE OVERVIEW MAP AND ZOOM/PAN TOOLS

The **Overview Map** is a handy tool for getting your bearings and navigating around the main Map Window. (Overview Map settings are not saved when you save and close the project and must be reset each time you launch the application.)

1. Click on **View** in the Menu Bar.

2. Click on **Overview Map** to turn it on.

3. Right click on the name of **2009 Parcel** Layer and scroll down in the pop-up box to select **Use in Overview Map**. A small version of the parcel map will appear in a box below the Table of Contents. The red box will highlight the area shown in the large Map Window.

4. Click and drag the small red rectangle in the Overview Map and watch how it changes the view in the large Map Window.

The **Zoom/Pan Toolbar** also contains several very useful tools for navigating around the map:

1. Click on the **Zoom In Tool** 🔍 and drag a diagonal red rectangle over an area of the large Map Window. Note the change in the red rectangle in the Overview Map.

2. Click on the **Zoom to Full Extent Tool** 🌐 to return the view to the entire extent of the Town. This is a good way to reset the view of the Map Window if you have zoomed in too far. It is also wise to start and end your session viewing at full extent.

3. Click on the **Pan Tool** 🖐 and drag the view in the large Map Window. Watch how in moves the small red rectangle in the Overview Map.

4. Click on the name of a Layer in the Table of Contents to make it the Active Layer. Then click on the **Zoom to Active Layer Tool** 🔍 to see the full extent of the selected Layer.

5. Try out the other tools in the Zoom/Pan toolbar. Click on the **Previous Extent Tool** 🔍 and **Next Extent Tool** 🔍 to see how they affect the view in both the large Map Window and the small Overview Map.

8.   SETTING MAP TIPS

Map Tips are small pop-ups that display data as you run your mouse over the Map Window. They can be used to display data about any field you select but are especially helpful for displaying parcel Tax Map Numbers. (Map Tips settings are not stored when you save and close the project and must be reset each time you launch the application.)

1. Click on the **Map Tips Button** in the Tool Bar to open the Map Tips dialog box.

2. Click on the **2009 Parcel** layer in the **Layers** drop down box

3. Click on **PrintKey** in the **Fields** drop down box.

4. Click the **Set Map Tips** button in the bottom right hand corner. Click OK to close the dialog box.

5. Slowly run your cursor over the parcels in the Map Window. The Tax Map number of the underlying parcel will display in a box by your cursor.

9.   VIEWING ORTHO IMAGERY

Orthoimagery combines the image characteristics of an aerial photograph with the geographic qualities of a map. New York State has an ongoing digital orthoimagery program with updates planned on a 3-4 year cycle. These high-resolution images can be viewed online and down-loaded for use in a GIS application. More information about the NYS orthimagery program is available at http://www.nysgis.state.ny.us/gateway/mg/ . (Unfortunately, the Mac version of AEJEE is not able to read the MrSID image format used for the 2004 orthoimages.)

The 2004 orthoimages for your municipality are included on the CD and are useful as a backdrop for your map. These are extremely large files which take a very long time to load. Therefore, it is best to turn on the 2004 Orthos layer only AFTER you have zoomed into your area of interest.

1. Use the **Zoom In Tool** to go to your area of interest. Check the map scale in the center of the Status Bar at the bottom of the map. The map scale must be closer than 1:12000 in order to see the orthoimages.

2. If the map scale is larger than 12000, zoom in again or go to **View>Zoom to Scale** and bring up the Zoom to Scale dialog box. Set the scale to a number less than 12000, then click the magnifying glass icon.

3. Click on the checkbox in front of the **2004 Orthos** Layer in the Table of Contents. The orthos will load slowly.

4. Turn off the **2004 Orthos** Layer before panning the map or you may crash the program! It is also a good idea to turn the Orthos Layer off before saving and exiting the program.

10.   USING THE IDENTIFY TOOL

You can use the **Identify Tool** to bring up a window showing the associated data for any feature.

1. Select the Layer in the Table of Contents that you are interested in by clicking on its name. It becomes the Active Layer and its name is highlighted in dark blue.

2. Click on the **Identify Tool** in the Tool Bar, then click on the feature in the Map Window that you want to learn about.

3. The Identify Results box will open. The left hand pane shows the name of the feature and the right hand pane displays the associated data.

11.   MEASURING DISTANCE

The Measure Tool helps you measure discrete distances and running totals on the map.

1. Click on the **Measure Tool** in the Tool Bar and select a unit of measurement, such as Feet, in the drop down box. Click, hold and drag the cursor to create a line in the Map Window. As you drag the line across the Map a gray box appears in the upper left hand corner showing the Segment length.

2. Release the cursor and click and drag again. The Total line in the gray box shows the total of all the Segments you have drawn. Double-click on the Map Window or select **Clear Measure Totals** in the Tool drop down box to clear measurements and start over.

12.   USING THE FIND TOOL

You can use the **Find Tool** to search for a parcel by the Tax Map number or Owner's last name.

1. Click the **Find Tool** in the Tool Bar to bring up the Find Tool dialog box. In the **Value** box type the exact Tax Map number (Section, Lot and Block) with the proper periods and dashes (for example Section 45, Block 1, Lot 17.2 should be entered as 45.00-1-17.2). This box is case sensitive so if searching by Owner's last name make sure it is capitalized.

2. Click on the **Find** button at the bottom of the left hand pane. Any matching parcels will be shown at the top of the right hand pane.

3. Click on the parcel(s) you are interested in. Click on the **Select** button at the bottom of right hand pane. The selected parcels are highlighted in yellow in the Map Window and the corresponding database rows in the attribute table are highlighted in turquoise.

4. Click on the **Pan To** or **Zoom To** button to move the map to show the selected parcels. (The **Pan To** button moves the map to the parcels without changing the current scale, while the **Zoom To** button zooms the map to just show the entire extent of the selected parcels.)

13.   USING THE SELECT TOOL

You can use the **Select Tool** to select a specific feature in the Map Window.

1. Select the Layer in the Table of Contents that you are interested in by clicking on its name. It becomes the Active Layer and its name is highlighted in dark blue.

2. Click on the **Select Tool** in the Tool Bar, then pick the type of selection in the drop down box. (Important: the Select Tool will not work by simply clicking on a feature--you must first select the type of selection geometry. Usually it is easiest to use the Rectangle select tool.

3. Draw a box (or circle, line or polygon) on the area you want to select. The selected area will be highlighted in yellow in the Map Window.

4. To see the data associated with the selected feature(s) click on **Attributes Tool** in the Tool Bar. The Attributes Table will open. Right click anyplace in the header row and select **Sort Selected Data to Top**. The selected features will move to the top of the list and be highlighted in turquoise.

5. If you right click on the OWNER_NAME header in the Attributes Table, and pick **Sort Ascending**, the list will be sorted into alphabetical order. Similarly, if you right click on the SBL header, the Tax Map numbers will be sorted in numerical order.

6. Click on the **Clear All Selection Tool** to clear the selected features.

14. CREATING A BUFFER

You can use the **Buffer Tool** to create a buffer around a selected feature such as a stream segment or wetland. You can also use the Tool to select features that fall within the buffer zone. This is very useful for creating an Abutters List to notify neighbors of a public hearing on a pending project. As an example, these instructions will show how to create a 500' buffer around a selected parcel.

1. Select the feature you want to buffer using the **Select Tool** (see Section 13) or **Find Tool** (see Section 12).

2. Click on the **Buffer Tool** in the Tool Bar. The Buffer Tool dialog box will open. Fill in **500** in the Buffer Distance box and pick **Feet** in the Buffer Units drop down box.

3. Click the check box in front of **Use buffer to select features from this layer** and select the 2009 Parcel Layer.

4. Click the **Apply** button. A 500' pink buffer will be drawn around the boundary of the selected parcel. All parcels that have any portion falling within the buffer zone will be highlighted in yellow, and are also selected in the 2009 Parcel Layer attribute table.

15.   EXPORTING AN ABUTTERS LIST

You can export the 2009 Greene County Real Property Tax Roll information for the parcels that fall within the 500' buffer.

1. Click on the **2009 Parcel Layer** in the Table of Contents to make it the Active Layer.

2. Click on the **Attribute Tool** in the Tool Bar. The Attribute Table for the 2009 Parcel Layer will open. Right click anyplace in the header row and select **Sort Selected Data to Top**. The parcels within the buffer will move to the top of the list and be highlighted in turquoise.

3. Right click in the header again and pick **Export Selected Data**. A Save dialog box will open. Navigate to where you want to save the list, give it a file name, and pick .csv (Comma Separated File) as the file type. A message box will open notifying you that the file has been created successfully. Click **OK**.

4. Navigate to the .csv file and open it with Excel. You can use the Mail Merge function in Word to create mailing labels from this file. However, you should check with the Town Clerk or Assessor to verify if the Owners' names and mailing addresses are still current.

16.   CREATING A QUERY

The Query Builder is a powerful tool for answering complex spatial questions. Building the query is similar to building a mathematical expression. The following example will show you how to find all the vacant parcels in your municipality that are at least 50 acres in size. You can use a similar process to find parcels meeting a different set of criteria. *(Note: There are two fields giving parcel size in the 2009 Parcel Layer Attribute Table. "Acreage" is the calculated GIS acreage, "Acres" is the Greene Co. Real Property Assessment Roll recorded acres.)*

1. Click on the **2009 Parcel Layer** in the Table of Contents to make it the Active Layer.

2. Click on the **Query Builder** in the Tool Bar.

3. In the **Select a field** window scroll down to the bottom and click on "**Land_Use**". The equation will build between the parentheses in the Equation Window below.

4. In the **Keypad Area** click on "**=**" (equals)

5. In **the Values** window click on "**300 Vacant Land**"

6. In the **Keypad** area click on "**and**"

7. In the **Select a Field** window click on "**Acreage**". You will get a pop-up box that says "There are more than 100 values in this field. Do you want to display all the values?" Click the **Yes** button.

8. In the **Keypad** area click on "**>=**" (greater than or equal to)

9. Click in the **Equation** box before the closing parentheses and type "**50**". The equation in the window below should look like (Land_Use = '300 Vacant Land' and Acreage >=50).

10. Click the **Execute** button. All of the vacant parcels that are at least 50 acres in size will appear in the results window. The parcels will also be highlighted in yellow in the Map Window, and in turquoise in the Attribute Table.

11. Click on the **Statistics** button to learn more information about these parcels. Put a check mark in the **Use Query Results** box. Select "**Acreage**" or "**Total AV**" in the **Select a Field** window and then click OK. The Statistics box will open telling you the number of parcels, maximum, minimum, mean, standard deviation, and total. If you don't check the **Use Query Results** box you will get the same information about the total Town.

17.   LABELING FEATURES

Right click on the **Active Layer**. Click on the **Lables** Tab. In the drop-down box pick the field that you want to use for the labels. You can adjust the font style, size and color. Click on the Effects button to allow duplicate labels or add a glow, etc. Click on OK. Please see Lesson 2 (pages 17-27) of the *AEJEE User Manual* for more details on symbolizing and labeling features.

18.   PRINTING AND EXPORTING MAPS

Click on **File>Print** in the Menu Bar to print an image of the main Map Window. You can also export an image of the Map Window by clicking on File>Export to Image and saving the image as a bmp, jpeg or png file. However, these images tend to be rather pixelated and will not include the orthoimagery or the legend shown in the Table of Contents.

The easiest way to create an image of your map that includes the Table of Contents and the orthoimagery is to make a screen capture of the currently selected window. Click on the **Alt** and **PrtScn** (Print Screen) buttons to take a screenshot which is stored in the Clipboard. Then open a Word document and hit **Paste** or **Ctrl**+**V** to paste this image into the document.

AEJEE also give you the ability to design a printed map layout that includes a title, scale bar and legend. Directions for creating a printed map layout are beyond the scope of this User Guide, but are included in Lesson 3 (pages 29-31) of the *AEJEE User Manual* on the CD.

19.   TROUBLESHOOTING

Although AEJEE is a very powerful program, it is a free light-weight GIS viewer intended for education use and is not a commercial product with a support team. The Mountain Top Mapping Application includes some very large datasets (especially the parcel database, steep slopes, topo and orthoimagery) that may stretch the capabilities of AEJEE to its limits. During testing of the application we have discovered solutions to some quirky behavior that you may experience:

1. **Compatibility Mode**
   AEJEE was last updated in 2007 and does not support some of the bells and whistles found in newer versions of the Windows operating system. Please read **Sections 2** and **3** on Installing and Running AEJEE in Compatibility Mode.

2. **Error Messages**
   You may sometimes encounter an error box when launching the application that says "Error with project file at line X > X." This is not serious. Click the OK box and proceed. You can usually avoid this error message if you maximize the AEJEE blank window BEFORE you open **YOUR TOWN.axl**. It is also good housekeeping to turn off extra

layers, zoom to full extent and save before you exit the program.

If the project will not load at all, you should replace the **YOUR TOWN.axl** file in the **C>ESRI>AEJEE>Data>Your Town** Data folder with a fresh copy from the CD.

3. **Table of Contents Anomalies**

   The Table of Contents may sometimes show duplicate symbols or otherwise not draw correctly when the application is launched. Zoom in on the Main Map Window and then Zoom to Full Extent. This will force the Table of Contents to redraw and should clear up any anomalies.

4. **Wavy Text in Tables**

   Sometimes the text in the Attribute Table will appear blurred when you attempt to scroll through the text. If this happens, simply click in the Table Header and the text should redraw and clarify.

5. **Label Problems**

   Lables have been set for streets, DEC stream classifications, soil types, and NED topo elevations. These should draw when you reach certain threshold scales (1:48000 for streets, 1:24000 for DEC streams, and 1:12000 for Soils and NED Topo). If the labels do not draw correctly, right click on the layer name in the Table of Contents to bring up the Properties Box. Click on the Labels tab, and scroll down to pick Arial in the Font box. Click OK.

6. **Random Quits**

   The program may quit if you do not have enough memory to load the orthoimagery tiles. Zoom in to your specific area of interest before you turn on the orthoimagery layer. Also turn off the ortho layer before you attempt to pan the map to a different area.

7. **No Disk in Drive Error**

   When launching AEJEE you may encounter an error box that says "There is no disk in the drive. Please insert a disk into drive." This is an annoying Java bug. Click Cancel (or put a disk in the CD drive) and the application should launch normally.

APPENDIX A

Data Sources and Limitations

DATA SOURCES AND LIMITATIONS

Please also see the disclaimers inside the front cover and the Metadata (data about the data) included on the CD.

Municipal Boundary
This layer was created from the 2009 Greene County Parcel Geodatabase for each Town. The *Muniline* file was exported as a shapefile and converted to a polygon.

2009 Greene County Parcel Boundaries with Real Property Tax Roll data
This layer was created from the 2009 Greene County Tax Parcel Geodatabase for each Town that was finalized in August 2009. The tax parcel boundaries were linked to the RPS data and exported as a shapefile. Please note that this layer does not include "suffixed parcels" such as condominium units that are not depicted on the County's paper tax maps. Greene County updates the digitized tax parcels annually but does not guarantee their accuracy or completeness.

Road Centerlines and Names
This layer was created from the March 2009 public *SimplifiedStreetSegment* shapefile prepared by the New York State Office of Cyber Security and Critical Infrastructure Coordination (CSCIC) under the Accident Location Information System (ALIS) project. Jurisdiction is noted in the JURISDICTI column: 01-State, 02-County, 03-Town, 13-Village. The public ALIS Streets file is available at the NYS GIS clearinghouse website at http://www.nysgis.state.ny.us and is updated annually. Metadata is included on the CD.

NYS DEC Streams and Classification
This layer was created from the NYS DEC classified streams *wtrcls_line* shapefile published in December 2007. This data should be used to identify water quality classifications for planning purposes only and must be field verified for regulatory purposes. Metadata is included on the CD.

NYC DEP Streams and Waterbodies
These layers were clipped to Town boundaries from the NYCDEP *stream24* and *water24* shape-files which were last revised in the summer of 2007. This data should be used to identify general locations of streams and water bodies for planning purposes only, but must be field verified for completeness and accuracy. DEP has emphasized that other small watercourses may be regulated streams depending on permanency of flow, connection to springs or wetlands and vegetation indicators. DEP plans to update this dataset in the next few years. Metadata is included on the CD.

NYS Certified Agricultural District Parcels
This layer was created from the 2009 Greene County Tax Parcel Geodatabase for each Town that was finalized in August 2009. Parcels may be added to a NYS Ag District during an annual one month window, and may be removed during the 8 year recertification review.

NWI (National Wetland Inventory) Wetlands
This data was downloaded from the NWI website http://www.fws.gov/wetlands and clipped to the Town boundaries. The NWI project is administered by the U.S. Fish and Wildlife Service (USFWS) and was established to generate information about the characteristics, extent and status of the Nation's wetlands and deepwater habitats. Aerial imagery was the primary data source

used to detect and characterize wetlands. Although NWI wetlands are not jurisdictional, they give an indication as to where Army Corps of Engineers wetlands may be located. Metadata is included on the CD.

NYS DEC Wetlands and 100' Wetland Buffer

These layers were created from the NYS Regulatory Freshwater Wetlands for Greene County, 2001. The data was downloaded from Cornell University Geospatial Information Repository (CUGIR) http://cugir.mannlib.cornell.edu/index.jsp in ArcExport .e00 format. It was converted to shapefiles, clipped to Town boundaries and buffered with a 100' buffer. NYSDEC wetlands are accurate at a scale of 1:24000 scale or smaller and must be field verified. Metadata is included on the CD.

FEMA Flood Zones

This layer was created from the Digital Flood Insurance Rate Map (DFIRM) Database finalized by the Federal Emergency Management Agency (FEMA) in 2008. For more detailed information including base flood elevations and cross sections please refer to the hard copy Greene County Flood Insurance Study and FIRM maps. Metadata is included on the CD.

Greene County Soil Types and Hydric Soils

This layer was created from the National Resource Conservation Service (NRCS) Greene Co. Soil Survey Geographic (SSURGO) database downloaded from http://soildatamart.nrcs.usda.gov/. New fields were added for hydric and agricultural soils. Metadata is included on the CD.

20' Topography and Steep Slopes

These layers were created from the National Elevation Dataset (NED) 1/3 Arc second obtained from the USGS Seamless Mapper at http://seamless.usgs.gov. This 2009 dataset has vertical accuracy to +/-7 meters. ESRI Spatial Analyst Extension was used to create 20' topo lines and steep slope layers from the Digital Elevation Models (DEMs). Metadata is included on the CD.

NYS Owned Land

This layer was created from the 2009 Greene County Tax Parcel Geodatabase for each Town that was finalized in August 2009. Parcels owned by all NY State agencies are included.

NYC DEP Land (current as of February 2010)

This layer was obtained from NYCDEP and is current as of February 2010. Please see the column "REType" (i.e. real estate type) to determine whether the property is fee, conservation easement or WAC farm easement. Metadata is included on the CD.

Existing Designated Hamlet Area

NYCDEP originally created this layer in 2001 using the existing parcel boundaries and Town resolutions. It may not match current parcel boundaries. The file has been updated slightly over the years as Towns opted in or out of excluding land from Land Acquisition in fee. Please see column "LAQ_EXCLD" to see if a designated area is excluded from Land Acquisition. ("Yes" means it is excluded.) Please see column "Type" to determine if a parcel is within a Designated Hamlet, Village Extension, or Commercial/Industrial area. NYC and the watershed towns are in the process of finalizing revised Designated Hamlet Areas and Village Extensions. Metadata is included on the CD.

Zoning Districts
The zoning layers for the Towns of Jewett and Lexington were obtained from the Greene County Department of Economic Development, Tourism and Planning. The zoning layer for the Village of Hunter was obtained from the LA Group who prepared it in 2003. The draft zoning layer for the Village of Tannersville was created by digitizing a draft paper zoning map prepared by Fraser & Associates in February 2009.

2009 Land Use
This layer is the same as the 2009 Parcel layer created from the 2009 Greene County Tax Parcel Geodatabase for each Town. A new "Land_Use" column was created by generalizing the "Prop_Class" field into major categories. Please see Appendix B for more information on Real Property Classification codes.

2004 NYS Digital Ortho Imagery
This layer was created using the 2004 NYS Greene County 2 foot panchromatic ortho images downloaded from http://www.nysgis.state.ny.us/gateway/mg/2004/greene/. These images are in MrSID (multiresolution seamless image database) format. Each tile has a pixel size of 2 feet and a horizontal accuracy of +/-8 feet. A projection (.prj) file was created for each image tile telling the application that is projected in New York State Plane NAD 83 Eastern Zone US Survey Feet. MrSID files are able to read by the Windows version of the application, but not the Mac version. The Metadata is on the CD.

APPENDIX B

NYS Office of Real Property Classification Codes

NYS OFFICE OF REAL PROPERTY CLASSIFICATION CODES

The 2009 Land Use layer included in the Mapping Application is color-coded to broad land use categories (Agricultural, Residential, Commercial, etc.). The following Classification Codes describe the detailed PROP_CLASS field included in the Attribute Table for each parcel.

100 - AGRICULTURAL

105 - Agricultural Vacant Land (Productive): Land used as **part** of an operating farm. It does not have living accommodations and cannot be specifically related to any of the other divisions in the agricultural category. Usually found when an operating farm is made up of a number of contiguous parcels.

110 - Livestock and Products

　　111 - Poultry and Poultry Products: eggs, chickens, turkeys, ducks and geese

　　112 - Dairy Products: milk, butter and cheese

　　113 - Cattle, Calves, Hogs

　　114 - Sheep and Wool

　　115 - Honey and Beeswax

　　116 - Other Livestock: donkeys, goats

　　117 - Horse Farms

120 - Field Crops: Potatoes, wheat, hay, dry beans, corn, oats, and other field crops.

130 - Truck Crops – Mucklands: Muckland used to grow potatoes, sugar beets, onions, snap beans, tomatoes, cabbage, lettuce, cauliflower, sweet corn, celery, etc.

140 - Truck Crops - Not Mucklands: Nonmuckland used to grow onions, snap beans, tomatoes, cabbage, lettuce, cauliflower, sweet corn, celery, carrots, beets, peas, etc.

150 - Orchard Crops

　　151 - Apples, Pears, Peaches, Cherries, etc.

　　152 - Vineyards

160 - Other Fruits: Strawberries, raspberries, dewberries, currants, etc.

170 - Nursery and Greenhouse: Buildings, greenhouses and land used for growing nursery stock, trees, flowers, hothouse plants, mushrooms, etc.

180 - Specialty Farms

　　181 - Fur Products: mink, chinchilla, etc.

　　182 - Pheasant, etc.

　　183 - Aquatic: oysterlands, fish and aquatic plants

　　184 - Livestock: deer, moose, llamas, buffalo, etc.

190 - Fish, Game and Wildlife Preserves

200 - RESIDENTIAL

210 - One Family Year-Round Residence: A one family dwelling constructed for year-round occupancy (adequate insulation, heating, etc.).

> **NOTE:** If not constructed for year-round occupancy, see code 260.

> **215 - One Family Year-Round Residence with Accessory Apartment:** A one family, year round residence with a secondary self contained swelling unit. Accessory apartments are usually contained within or added to the principle residence and are office occupied by immediate family members.

220 - Two Family Year-Round Residence: A two family dwelling constructed for year-round occupancy.

230 - Three Family Year-Round Residence: A three family dwelling constructed for year-round occupancy.

240 - Rural Residence with Acreage: A year-round residence with 10 or more acres of land; it may have up to three year-round dwelling units.

> **241 - Primary residential, also used in agricultural production**

> **242 - Recreational use**

250 - Estate: A residential property of not less than 5 acres with a luxurious residence and auxiliary buildings.

260 - Seasonal Residences: Dwelling units generally used for seasonal occupancy; not constructed for year-round occupancy (inadequate insulation, heating, etc.). If the value of the land and timber exceeds the value of the seasonal dwelling, the property should be listed as forest land (see category 900).

> **NOTE:** If constructed for year-round occupancy, see code 210.

270 - Mobile Home: A portable structure built on a chassis and used as a permanent dwelling unit.

> **271 - Multiple Mobile Homes:** More than one mobile home on one parcel of land; not a commercial enterprise.

280 - Residential - Multi-Purpose/Multi-Structure

> **281 - Multiple Residences:** More than one residential dwelling on one parcel of land. May be a mixture of codes 210's, 220's, and 230's, or all one type.

> **283 - Residence with Incidental Commercial Use:** A residence which has been partially converted or adapted for commercial use (e.g. residence with small office in basement). Primary use is residential.

300 - VACANT LAND

310 - Residential

> **311 - Residential Vacant Land:** Vacant lots or acreage located in areas.

312 - Residential Land Including a Small Improvement (not used for living accommodations): Includes a private garage on a parcel of land separate from the residence. Does not include a small garage where space is rented out (see code 439).

314 - Rural Vacant Lots of 10 Acres or Less: Located in rural residential areas.

315 - Underwater Vacant Land: Underwater land, in a seasonal residential area, not owned by a governmental jurisdiction.

320 - Rural

321 - Abandoned Agricultural Land: Nonproductive; not part of an operating farm.

322 - Residential Vacant Land Over 10 Acres: Located in rural areas.

323 - Other Rural Vacant Lands: Waste lands, sand dunes, salt marshes, swamps, rocky areas, and woods and brush of noncommercial tree species not associated w/forest lands.

330 - Vacant Land Located in Commercial Areas

331 - Commercial Vacant Land with Minor Improvements

340 - Vacant Land Located in Industrial Areas

341 - Industrial Vacant Land with Minor Improvements

350 - Urban Renewal or Slum Clearance: Vacant lots or acreage undergoing urban renewal or slum clearance; improvements must be abandoned.

380 - Public Utility Vacant Land: Public utility company vacant land.

400 - COMMERCIAL

410 - Living Accommodations

411 - Apartments

414 - Hotel

415 - Motel

416 - Mobile Home Parks (trailer parks, trailer courts): The mobile homes are usually owner occupied but the land and facilities are rented or leased.

417 - Camps, Cottages, Bungalows: Usually rented on a seasonal basis.

418 - Inns, Lodges, Boarding and Rooming Houses, Tourist Homes, Fraternity and Sorority Houses: Sleeping accommodations with or without meals or kitchen priv.

420 - Dining Establishments

421 - Restaurants: Facilities which serve full course meals with or without legal beverages.

422 - Diners and Luncheonettes: Usually year-round facilities with counter service and limited seating.

423 - Snack Bars, Drive-Ins, Ice Cream Bars: Usually seasonal, with window and/or car service, possibly limited counter service (e.g., A&W Root Beer, Tastee Freeze, etc.)

    424 - Night Clubs: Facilities which feature an extensive menu, legal beverages and live entertainment.

    425 - Bar: Facilities which serve only legal beverages, not food.

    426 - Fast Food Franchises: Year-round, with counter service, limited menus and a drive-up window (e.g., McDonald's, Burger King, etc.).

430 - Motor Vehicle Services

    431 - Auto Dealers - Sales and Service: Includes truck or farm machinery dealerships, auto or truck rental agencies, motor home sales and service facilities, etc.

    432 - Service and Gas Stations: Sell gasoline and/or provide minor repairs and services.

    433 - Auto Body, Tire Shops, Other Related Auto Sales: Specialized auto equipment and repair (e.g., Goodyear Tire Center, Firestone, etc.).

    434 - Automatic Car Wash: Car is pulled through a series of cleaning processes.

    435 - Manual Car Wash: Car is driven into a stall; revolving brushes rotate around the car (semiautomatic).

    436 - Self-Service Car Wash: Usually a multi stall structure featuring a car owner operated coin system with spray type hoses for washing and rinsing a car.

    437 - Parking Garage: Usually a multistory structure with elevators and/or ramps, used mainly for car storage.

    438 - Parking Lot: A commercial open parking lot for motor vehicles.

    439 - Small Parking Garage: Garage with two or more rented stalls, usually in a res. area

440 - Storage, Warehouse and Distribution Facilities

    441 - Fuel Storage and Distribution Facilities: Facility for fuel storage and distribution including gasoline, oil, gas, petroleum, etc.

    442 - Mini Warehouse (Self Storage): Partitioned warehouse space used for multiple tenant self service storage.

    443 - Grain and Feed Elevators, Mixers, Sales Outlets

    444 - Lumber Yards, Sawmills

    445 - Coal Yards, Bins

    446 - Cold Storage Facilities: Used for perishables, produce or other items.

    447 - Trucking Terminals

    448 - Piers, Wharves, Docks and Related Facilities

    449 - Other Storage, Warehouse and Distribution Facilities

450 - Retail Services

    451 - Regional Shopping Centers: Multi occupant facilities with ten or more stores, usually featuring a large department store or two, and ample paved parking.

452 - Area or Neighborhood Shopping Centers: Smaller shopping facilities which usually feature a junior department store, several other stores, and ample parking; may include a supermarket.

453 - Large Retail Outlets: These facilities are usually complemented by a large supermarket and have ample parking (e.g., Ames, Wal-Mart, etc.).

454 - Large Retail Food Stores: These facilities usually belong to a chain and sell food and sundry items (e.g., Price Chopper, Hannaford, Wegmans, P&C, Big M, etc.).

455 - Dealerships - Sales and Service (other than auto with large sales operation) Boats (also refer to code 570), snowmobiles, garden equipment, etc.

460 - Banks and Office Buildings

461 - Standard Bank/Single Occupant

462 - Drive-In Branch Bank

463 - Bank Complex with Office Building

464 - Office Building

465 - Professional Building

470 - Miscellaneous Services

471 - Funeral Homes

472 - Dog Kennels, Veterinary Clinics

473 - Greenhouses

474 - Billboards

475 - Junkyards

480 - Multiple Use or Multi-purpose: A building readily adaptable, with little physical change, for more than one use or purpose.

481 - Downtown Row Type (with common wall): Usually a two or three story older structure with retail sales/services on the first floor and offices and/or apartments on the upper floors; little or no on-site parking.

482 - Downtown Row Type (detached): Same type of use as 481, but this is a separate structure without party walls.

483 - Converted Residence: A building usually located in a residential area, which has been partially converted or adapted for office space (e.g., a doctor's or dentist's office with an apartment upstairs).

484 - One Story Small Structure: Usually a modern, one occupant, building adaptable for several uses (e.g., retail clothing store, small office, warehouse, pet shop, etc.).

485 - One Story Small Structure - Multi occupant: Usually partitioned for two or more occupants, such as a liquor store, drug store, and a laundromat; limited parking on site.

486 - Minimart: Combination snack bar, market and gas station.

500 - RECREATION AND ENTERTAINMENT

510 - Entertainment Assembly

    511 - Legitimate Theaters: Used primarily for live presentations of the performing arts.

    512 - Motion Picture Theaters: (excludes drive-in theaters)

    513 - Drive-In Theaters

    514 - Auditoriums, Exhibition and Exposition Halls

    515 - Radio, T.V. and Motion Picture Studios

520 - Sports Assembly

    521 - Stadiums, Arenas, Armories, Field Houses

    522 - Racetracks: Used for auto, horse, motorcycle, go-cart, or drag racing.

530 - Amusement Facilities

531 - Fairgrounds

    532 - Amusement Parks

    533 - Game Farms

    534 - Social Organizations: Elks, Moose, Eagles, and Veterans' Posts, etc.

540 - Indoor Sports Facilities

    541 - Bowling Centers

    542 - Ice or Roller Skating Rinks

    543 - YMCA's, YWCA's, etc.

    544 - Health Spas

    545 - Indoor Swimming Pools

    546 - Other Indoor Sports: Tennis courts, archery ranges, billiard centers, etc.

550 - Outdoor Sports Activities

    551 - Skiing Centers: May include sleeping and dining facilities; not ski facilities of resort complexes.

    552 - Public Golf Courses: May include other associated sports facilities/dining facilities.

    553 - Private Golf Country Clubs: Includes those with other sports and dining facilities.

    554 - Outdoor Swimming Pools

    555 - Riding Stables

    556 - Ice or Roller Skating Rinks (may be covered)

    557 - Other Outdoor Sports: Driving ranges, miniature golf, tennis, baseball, etc.

560 - Improved Beaches: Improvements include bath houses, parking facilities, etc.

570 - Marinas: Improvements include docks and piers, boat storage facilities, repair shops, etc.

580 - Camps, Camping Facilities and Resorts

    581 - Camps: Used by groups of children and/or adults.

    582 - Camping Facilities: Improved areas/parks with accommodations for tents, campers or travel trailers or RV's.

    583 - Resort Complexes: Dude ranches, resort hotels with sports facilities, etc.

590 - Parks

    591 - Playgrounds

    592 - Athletic Fields

    593 - Picnic Grounds

600 - COMMUNITY SERVICES

610 - Education

    611 - Libraries

    612 – Schools: General, elementary and secondary

    613 - Colleges and Universities

    614 - Special Schools and Institutions: Used for the physically or mentally impaired.

    615 - Other Educational Facilities

620 - Religious

630 - Welfare

    631 - Orphanages

    632 - Benevolent and Moral Associations

    633 - Homes for the Aged

640 - Health

    641 - Hospitals

    642 - All Other Health Facilities

650 - Government

    651 - Highway Garage: Used for the storage and maintenance of highway equipment by any governmental jurisdiction; includes associated land.

    652 - Office Building: Owned by any governmental jurisdiction; includes associated land.

    653 - Parking Lots: Owned by any governmental jurisdiction; includes land and appurtenant structures such as open single level lots as well as multilevel garages.

660 - Protection

    661 - Army, Navy, Air Force, Marine and Coast Guard: Installations, Radar, etc.

662 - Police and Fire Protection, Electrical Signal: Equipment and Other Facilities for Fire, Police, Civil Defense, etc.

670 - Correctional: Used by any gov. jurisdiction for criminal justice system housing.

680 - Cultural and Recreational

681 - Cultural Facilities: Museums, art galleries, etc.

682 - Recreational Facilities: Nature trails, bike paths, etc.

690 - Miscellaneous

691 - Professional Associations

692 - Roads, Streets, Highways and Parkways, Express or Otherwise (if listed) Including Adjoining Land

693 - Indian Reservations

694 - Animal Welfare Shelters

695 - Cemeteries

700 - INDUSTRIAL

710 - Manufacturing and Processing

712 - High Tech. Manufacturing and Processing: These buildings are used as research laboratories with a high percentage of office/laboratory space. The construction costs of these facilities are higher than other warehouse/manufacturing facilities reflecting their architectural design, super adequate upgrades, and more comprehensive finish.

714 - Light Industrial Manufacturing and Processing: These structures may have been built for a specific manufacturing process. They feature high ceilings and open construction which allows for good workflow.

715 - Heavy Manufacturing and Processing: These are large area structures design and built for production. They will have extensive concrete foundations for industrial equipment and a high voltage electrical system.

720 - Mining and Quarrying: This category includes parcels used in or necessary adjunct to the provision of mining and quarrying, i.e., sand and gravel, limestone, trap rock, salt, iron and titanium, talc, lead and zinc, gypsum, and other mining and quarrying.

730 - Wells

731 - Oil - Natural Flow (for production)

732 - Oil - Forced Flow (for production)

733 - Gas (for production)

734 - Junk

735 - Water used for Oil Production

736 - Gas or Oil Storage Wells

740 - Industrial Product Pipelines: Pipelines used by nonutility companies, not in Special Franchise.

> **741 - Gas**
>
> **742 - Water**
>
> **743 - Brine**
>
> **744 - Petroleum Products**
>
> **749 - Other**

800 - PUBLIC SERVICES

820 - Water

> **821 - Flood Control:** Land used for accumulation, storage or diversion of water for flood control.
>
> **822 - Water Supply:** Land used for the accumulation, storage, transmission or distribution of water for purposes other than flood control or production of electricity.
>
> **823 - Water Treatment Facilities**
>
> **826 - Water Transmission - Improvements**
>
> **827 - Water Transmission - Outside Plant**

830 - Communication: Includes all telephones, telecommunications, telegraph, radio, television and CATV property.

> **831 - Telephone:** Telephone and telecommunications land, buildings, towers, antennae, etc., except cellular telephone towers - see 837
>
> **832 - Telegraph**
>
> **833 - Radio**
>
> **834 - Television other than Community Antenna Television**
>
> **835 - Community Antenna Television**
>
> **836 - Telephone Outside Plant:** Poles, wires, cable, etc.
>
> **837 - Cellular Telephone Towers**

840 - Transportation

> **841 - Motor Vehicle:** Land used in the provision of transportation services by motor vehicles (e.g., bus terminals, taxicab garages, truck terminals and warehouses, etc.).
>
> **842 - Ceiling Railroad:** Real property for which the State Board establishes the maximum taxable assessed value.
>
> **843 - Nonceiling Railroad**
>
> **844 - Air**
>
> **845 - Water:** Land used for water transportation (e.g., canal).
>
> **846 - Bridges, Tunnels and Subways**
>
> **847 - Pipelines:** Pipelines used by utility companies for transp. of petroleum products.

850 - Waste Disposal: Does **not** include facilities used exclusively for the disposal of waste from an industrial process, which should be coded as industrial property.

    851 - Solid Wastes: Incinerators and waste compacting facilities. Does not include landfills and dumps (see code 852).

    852 - Landfills and Dumps

    853 - Sewage Treatment and Water Pollution Control

    854 - Air Pollution Control

860 - Special Franchise Property: Real property for which the State Board establishes assessments.

    861 - Electric and Gas

    862 - Water

    866 - Telephone

    867 - Miscellaneous

    868 - Pipelines

    869 - Television

870 - Electric and Gas

    871 - Electric and Gas Facilities: General electric and gas facilities, buildings, and land including offices, garages, service centers, etc.

    872 - Electric SubStation, **Electric Power Generation Facilities:** Includes all land and facilities associated with electric generating stations, i.e. power plant equipment, reservoirs, dams, power house, penstock pipe, waterway structures, etc.

    873 - Gas Measuring and Regulation Station

    874 - Electric Power Generation Facility - Hydro

    875 - Electric Power Generation Facility - Fossil Fuel

    876 - Electric Power Generation Facility - Nuclear

    877 - Electric Power Generation Facility - Other Fuel

880 - Electric and Gas Transmission and Distribution

    882 - Electric Transmission Improvement

    883 - Gas Transmission Improvement

    884 - Electric Distribution - Outside Plant Property

    885 - Gas Distribution - Outside Plant Property

900 - WILD, FORESTED, CONSERVATION LANDS AND PUBLIC PARKS

910 - Private Wild and Forest Lands except for Private Hunting and Fishing Clubs: All private lands which are associated with forest land areas that do not conform to any other property type classification, plus plantations and timber tracts having merchantable timber.

> **911 - Forest Land Under Section 480 of the Real Property Tax Law**

> **912 - Forest Land Under Section 480-a of the Real Property Tax Law**

920 - Private Hunting and Fishing Clubs

930 - State Owned Forest Lands

> **931 - State Owned Land (Forest Preserve) in the Adirondack or Catskill Parks Taxable Under Section 532-a of the Real Property Tax Law**

> **932 - State Owned Land Other Than Forest Preserve Covered Under Section 532-b, c, d, e, f, or g of the Real Property Tax Law**

940 - Reforested Land and Other Related Conservation Purposes

> **941 - State Owned Reforested Land Taxable Under Sections 534 and 536 of the Real Property Tax Law**

> **942 - County Owned Reforested Land**

950 - Hudson River and Black River Regulating District Land

960 - Public Parks

> **961 - State Owned Public Parks, Recreation Areas, and Other Multiple Uses**

> **962 - County Owned Public Parks and Recreation Areas**

> **963 - City/Town/Village Public Parks and Recreation Areas**

970 - Other Wild or Conservation Lands

> **971 - Wetlands, Either Privately or Governmentally Owned, Subject to Specific Restrictions as to Use**

> **972 - Land Under Water, Either Privately or Governmentally Owned** (other than residential - more properly classified as code 315)

980 - Taxable State Owned Conservation Easements

990 - Other Taxable State Land Assessments

> **991 - Adirondack Park Aggregate Additional Assessments (Real Property Tax Law, Section 542(3))**

> **992 - Hudson River-Black River Regulating District Aggregate Additional Assessments (Environmental Conservation Law, Section 15-2115)**

> **993 - Transition Assessments for Taxable State Owned Land (Real Property Tax Law, Section 545)**

> **994 - Transition Assessments for Exempt State Owned Land (Real Property Tax Law, Section 545**

APPENDIX C

Importing GPS Points

The attached instructions show a simple method of importing GPS points into AEJEE.

If you have a Garmin GPS unit you can download the free DNR Garmin Application
from the Minnesota Department of Natural Resources.
This tool will convert GPS waypoints, track and routes to shapefiles.

http://www.dnr.state.mn.us/mis/gis/tools/arcview/extensions/DNRGarmin/DNRGarmin.html

Instructional videos:

http://cobweb.ecn.purdue.edu/~caagis/PurdueGIS/video/

http://cobweb.ecn.purdue.edu/~caagis/PurdueGIS/video/dnrgarmin0410/dnrgarmin0410.html

GPS to GIS with AEJEE

Using ESRI GIS Software: Arc Explorer Java Edition for Education (AEJEE)

1. Mark waypoints with GPS in the field. The waypoints consist of the latitude, longitude, and elevation of your location. Ideally, use a clipboard to describe each location (i.e. fire hydrant, storm drain, plant species).

2. Create a table of your data and save it as a .csv file. You can use most spreadsheet applications, such as MS Excel. Make sure your GPS units are set to decimal degrees, then manually scroll through the saved waypoints to enter the waypoints into your table. It should look something like this:

site	latitude	longitude	name
1	20.93422	-156.50418	lagoon
2	20.93333	-156.50473	roadxstream
3	20.9344	-156.50414	delta
4	20.9341	-156.50352	sandybeach

3. In AEJEE, go to View: Add Event Theme. Choose the appropriate Table by finding your newly created ".csv" file.

4. Set the X and Y Fields as follows:
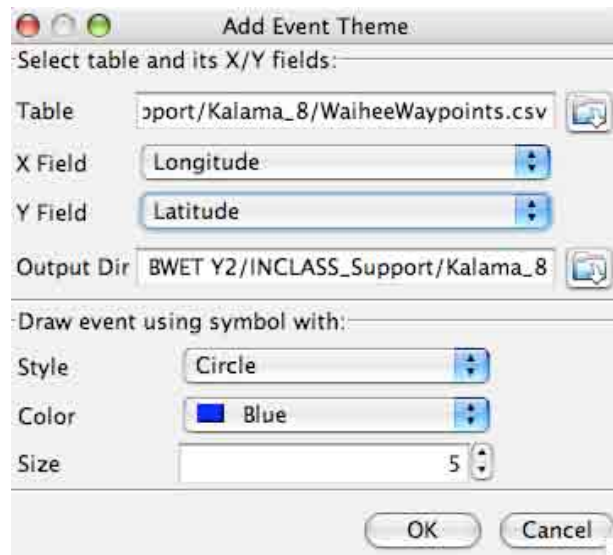
5. Click OK, then you should see blue dots show up on your map AND you should see your waypoints show up as a 'Layer' on the left. Zoom in on the points on the map. You can also control click on the layer, and select "zoom to layer".

Note: If your points do not show up in the appropriate location, check your table and make sure it has the appropriate lat/long decimal numbers (and positive or negative values!).

ADDING LAYERS TO YOUR AEJEE PROJECT

Greene County has given the Mountain Top Towns permission to receive GIS data for adjacent municipalities. You will receive the data on a CD. Each Town's data will be in a separate folder named OTHER TOWN (in all capital letters). Inside each OTHER TOWN folder will be the custom **Other Town.axl** project file and the **Other Town GIS Data** folder. Copy and paste each entire OTHER TOWN folder into your main AEJEE data folder: **C>ESRI>AEJEE>Data.**

1. Launch AEJEE and maximize the Window. Load **Your Town.axl**. Click **File>Save As** to create a new .axl file that will include both Towns. Give it a new name and click Save.

2. Click on the **Add Data** button in the Tool Bar. The Content Chooser window will open and show you all the folders in the main AEJEE data folder.

3. Double click the OTHER TOWN folder, then double click the **Other Town GIS Data** folder. Click on the **2009 Parcel** layer or any other layer that you want to add. Hit OK.

4. The new layer will be added to the top of the Table of Contents and the Main Map Window.

5. Click on the **Zoom to Full Extent** button to see both Towns at once.

NOTES:

A. SYMBOLS: New layers are added as a solid color by default and you can not see layers underneath them. You can change their symbol to make them transparent outlines. Right click on the name of the layer in the Table of Contents and click on Properties to bring up the Properties box. You should be in the **Symbols** Tab. In the **Style** drop-down box pick "**Transparent fill**." Hit Apply and close the box.

You can also change classification, colors, fill styles and outline styles by playing with other features in the Symbols window. See Lesson 2 (pages 17-24) in the *AEJEE User Manual* on your original install CD (or in the Help Menu) for more information on symbology and classification.

B. DRAW ORDER: The order of layers in the Table of Contents reflects their drawing order, with the bottommost layers drawn first. Drag layers up or down in the Table of Contents to make them draw over or under other layers.

C. RENAMING: Some layers you add for other Towns may have duplicate names to existing layers from your Town. To avoid confusion you can rename a layer by right clicking on its name in the Table of Contents, picking Rename, and typing in a custom name. You can also rename the layer under the **General** Tab in the Properties box.

D. OVERVIEW MAP: You can add the Parcel layers and Town boundaries from all the Towns in your project to the little Overview Map.

E. ORTHOIMAGERY: Although it is best to view the other Town's orthos by loading the **Other Town.axl** file, it is possible to add them to your project. (But be forewarned that you may crash the program!) Click on the Add Data button to open the Content Chooser. Go to **OTHER TOWN>Other Town GIS Data>2004 Orthos.** Click on ***ImageDirectory** and hit OK. The ***ImageDirectory** layer will be added to the bottom of the Table of Contents and all the image tiles will immediately start to draw very slowly in the Main Map Window.

You should set a scale dependency so the orthos only draw when you are zoomed in. Toggle off the ***ImageDirectory** layer by clicking the checkmark in the Table of Contents. Right click on the layer name and click on Properties in the drop-down box to bring up the Properties box. Click on "Only show layer when zoomed in closer than 1: _____." Fill in a number such as 12000. Toggle the layer back on.

In order to make the Parcel and Road layers more distinct, you can slightly lighten the orthos by setting the transparency to 20% in the bottom of the Properties box.

Funding Resources

Septic Systems

Agency	Funding Name	General Description/Information
Catskill Watershed Corporation (CWC)	Septic Rehabilitation and Replacement Program	This program reimburses eligible homeowners for the cost of repairing or replacing residential septic systems.
Catskill Watershed Corporation (CWC)	Septic Maintenance Program	This program helps homeowners who have received new systems from the CWC pay to have them maintained every three years.
Catskill Watershed Corporation (CWC)	Business Septic Repair Program	This program helps owners of small businesses pay for septic system repairs.
Catskill Watershed Corporation (CWC)	Cluster System Septic Program	This program addresses on-site wastewater management for clusters of buildings.
Catskill Watershed Corporation (CWC)	Community Wastewater Management Program	This program is intended to fund the planning, design and construction of community septic systems and/or the creation of septic maintenance districts in West-of-Hudson communities.
Catskill Watershed Corporation (CWC)	Alternate Design Septic Program	This program is intended to pay eligible costs of new septic system installations, those costs being added solely due to requirements of the NYC Watershed regulations. Reimbursement is allowed for only those cost increases attributable to the regulations.

Flood Mitigation

Agency	Funding Name	General Description/Information
Federal Emergency Management Agency (FEMA)	Flood Mitigation Assistance (FMA) Program	The FMA Program provides funding to states, federally-recognized Indian tribal governments, and communities so that cost-effective measures can be taken to reduce or eliminate long-term risks of flood damage to buildings, manufactured homes and other structures insured under the National Flood Insurance Program (NFIP). Long-term goals of the program include the reduction or elimination of claims under the NFIP through mitigation activities. Three types of grants are available under FMA: Planning, Project and Technical Assistance.
Federal Emergency Management Agency (FEMA)	Hazard Mitigation Grant Program	The Hazard Mitigation Grant Program provides funds to States, Territories, Indian Tribal governments, local governments, and eligible private non-profits following a Presidential major disaster declaration. The common goal of the program is to reduce the risk of loss of life and property due to natural hazards.
Federal Emergency Management Agency (FEMA)	Pre-Disaster Mitigation Program	The Pre-Disaster Mitigation program will provide funds to states, territories, Indian tribes, communities, colleges, and universities for pre-disaster mitigation planning and the implementation of cost-effective mitigation projects prior to a disaster event. Funding these plans and projects reduces overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations.
U.S. Army Corps of Engineers	Snagging and Clearing for Flood Control (CAP Section 208)	Work under this authority provides for local protection from flooding by channel clearing and excavation, with limited embankment construction by use of materials from the clearing operation only.
USDA NRCS	Emergency Watershed Protection (EWP) Program	The EWP program helps protect lives and property threatened by natural disasters such as floods, hurricanes, tornadoes, droughts, and wildfires. EWP Program provides funding for such work as clearing debris from clogged waterways, restoring vegetation, and stabilizing river banks. EWP also provides funds to purchase floodplain easements as an emergency measure. Floodplain easements restore, protect, maintain, and enhance the functions of the floodplain; conserve natural values including fish and wildlife habitat, water quality, flood water retention, ground water recharge, and open space; reduce long-term federal disaster assistance; and safeguard lives and property from floods, drought, and the products of erosion.

Energy Efficiency

Agency	Funding Name	General Description/Information
NYSERDA	Energy Efficiency and Conservation Block Grants - ARRA	The Energy Efficiency and Conservation Block Grant Program (EECBG) provides grants to U.S. local governments, states, territories, and Indian tribes, to fund projects that reduce energy use and fossil fuel emissions, and improve energy efficiency.
NYSERDA	Multifamily Building Performance Program	This program provides an opportunity for businesses providing energy efficiency services to multifamily buildings. The program will address all combinations of market-rate, low- to moderate-income, existing, gut rehabilitation and new construction projects through a common process and a varying schedule of incentives.
NYSERDA	Weatherization Formula Grants - ARRA	This grant provides to assist income-eligible families and individuals by reducing their heating/cooling costs and improving the safety of their homes through energy efficiency measures.
NYSERDA	State Energy Efficient Appliance Rebate Program - ARRA	Under the approved plan, consumers could receive rebates for purchasing eligible appliances individually or in a bundle. Appliances will qualify only if they have earned the ENERGY STAR® label, meaning that they are up to 30 percent more efficient than standard models on the market. Consumers may receive a larger rebate by purchasing three eligible appliances that meet standards issued by the Consortium of Energy Efficiency (CEE) that are higher than ENERGY STAR standards.
U.S. Department of Energy	Weatherization Assistance for Low-Income Persons - ARRA	This program funds the improvement of the thermal efficiency and cooling of dwellings by the installation of weatherization materials such as attic insulation, caulking, weather-stripping, furnace efficiency modifications, certain mechanical measures to heating and cooling systems, and replacement furnaces, boilers and air-conditioners.
NYSERDA	Existing Facilities Program	The New York State Energy Research and Development Authority's (NYSERDA) Existing Facilities Program offers incentives for a variety of energy projects including Pre-Qualified Measures and Performance-Based Incentives. Applicants can receive incentives ($/unit) for pre qualified energy-efficiency and conservation measures. The performance-based incentives component of the Existing Facilities Program offers performance-based incentives to customers or ESCO's who are working on large-scale energy efficiency projects. Performance-based incentives are typically higher than pre-qualified incentives but are based on an engineering analysis and are potentially subject to measurement and verification (M&V) requirements.
USDA	Renewable Energy Feasibility Grants	The Rural Energy for America Program will provide funds to agricultural producers and rural small businesses to conduct feasibility studies for renewable energy systems. The Rural Energy for America Program is designed to help agricultural producers and rural small businesses reduce energy costs and consumption and help meet the nation's critical energy needs. Eligible technologies include: projects that produce energy from wind, solar, biomass, geothermal, hydro power and hydrogen-based sources.

Water, Wastewater and Stormwater

Funding Resources

Agency	Funding Name	General Description/Information
Catskill Watershed Corporation (CWC)	Future Stormwater Program	The purpose of this program is to help offset costs associated with SWPPPs required by the New York City Department of Environmental Protection. This program reimburses applicants for eligible design and construction costs and also covers eligible costs exceeding what a Watershed property owner would be required to pay to meet state and federal stormwater standards.
Catskill Watershed Corporation (CWC)	Stormwater Retrofit Program	This program provides funds to correct or reduce water quality problems associated with erosion or substandard stormwater management conditions existing on or before January 21, 1997. Municipalities, organizations, businesses and individual property owners may apply for funding to design, construct, implement and maintain stormwater Best Management Practices to address runoff in concentrated areas of impervious surfaces in the West-of Hudson-Watershed.
Catskill Watershed Corporation (CWC)	Community Stormwater Infrastructure Planning and Assessment Program	This program encourage counties, towns and villages in the West-of-Hudson Watershed to conduct detailed and comprehensive assessments of existing public stormwater infrastructure with the goal of evaluating their systems and identifying and prioritizing potential areas for Best Management Practice installations.
Environmental Facilities Corporation & NYCDEP	Wastewater Treatment Plant Upgrade Program	In collaboration with the New York State Environmental Facilities Corporation (EFC), NYCDEP funds a Wastewater Treatment Plant Upgrade Program that includes two distinct components for existing non-City-owned wastewater treatment plants: Regulatory Upgrades and SPDES (State Pollutant Discharge Elimination System) Upgrades. The Regulatory Upgrade Program helps non-City-owned wastewater treatment plants meet the higher treatment and compliance standards of the New York City Watershed Regulations that go beyond federal or State requirements. The SPDES Upgrade Program helps West-of-Hudson wastewater treatment plants meet the conditions of their respective SPDES permits.
Environmental Facilities Corporation (EFC)	Industrial Finance Program (IFP)	The IFP gives loans to NY businesses to help manage their wastes, control pollution, build and improve drinking water, waste water and solid waste facilities, and comply with environmental regulations. Through this program businesses are able borrow at a lower cost than conventional financing options.
Environmental Facilities Corporation, NYCDEP & CWC	New Sewage Treatment Infrastructure Program	This program was established because the oldest and most populated communities in the Catskill/Delaware Watershed were generally built along streams in narrow valleys which have small-size lots (many on steep slopes) which make it problematic to install individual septic systems that meet current water quality standards. For many of these communities, the costs of building and operating new sewage treatment plants are prohibitive. The New Sewage Treatment Infrastructure Program provides funding for the construction of new sewage treatment facilities in watershed communities whose water quality is most threatened by failing septic systems.
U.S. Army Corps of Engineers	Project Modifications for Improvement of the Environment (CAP Section 1135)	Work under this authority provides for modifications in the structures and operations of water resources projects constructed by the Corps of Engineers to improve the quality of the environment. Additionally, the Corps may undertake restoration projects at locations where an existing Corps project has contributed to the degradation. The primary goal of these projects is ecosystem restoration with an emphasis on projects benefiting fish and wildlife. The project must be consistent with the authorized purposes of the project being modified, environmentally acceptable, and complete within itself.
U.S. Department of Commerce	Investments for Public Works and Economic Development Facilities - ARRA	Public Works grants support the construction/rehabilitation of essential public infrastructure and facilities necessary to generate or retain private sector jobs and investments, attract private sector capital, and promote regional competitiveness, innovation, and entrepreneurship, including investments that expand and upgrade infrastructure to attract new industry, support technology-led development, accelerate new business development, and enhance the ability of regions to capitalize on opportunities presented by free trade.
U.S. Department of the Interior	Water Conservation Field Services Program (WCFSP)	The WCFSP actively encourages water conservation and efficient use of water supplies on Federal Reclamation projects, assists water districts with their responsibility to develop water conservation plans, implements measures identified in their plans, and complements and supports conservation programs.
U.S. Department of the Interior	Recreation Resources Management - ARRA	This program provides opportunities for public recreation at Bureau of Reclamation or other publicly-owned water projects, and to encourage State, county, and local governments to fund and manage recreation resources at these project areas.
U.S. EPA	Construction Grants for Wastewater Treatment Works - ARRA	To assist and serve as an incentive in construction of municipal wastewater treatment works which are required to meet State and/or Federal water quality standards and improve the water quality in the waters of the United States.
U.S. EPA	Water Quality Management Planning	The purpose of this program is to assist State water quality management agencies and others in carrying out water quality management planning. State agencies are encouraged to give priority to watershed restoration planning.
U.S. EPA	Brownfields Assessment and Cleanup Cooperative Agreements/Brownfields Assessment, Revolving Loan Fund and Cleanup (ARC) Grant	The objectives of the brownfield assessment, revolving loan fund and cleanup cooperative agreements are to provide funding to inventory, characterize, assess, and conduct planning and community involvement related to brownfield sites; to capitalize a revolving loan fund (RLF) and provide sub grants to carry out cleanup activities at brownfield sites; and, to carry out cleanup activities at brownfield sites that are owned by the grant recipient. EPA's Brownfields ARC Program promotes the assessment, cleanup, and redevelopment of America's brownfields.
USDA	Water Resources Research National Competitive Grants Program	This program funds research on the topics of water supply and water availability. Proposals are sought in not only the physical dimensions of supply and demand, but also quality trends in raw water supplies, the role of economics and institutions in water supply and demand, institutional arrangements for tracking and reporting water supply and availability, and institutional arrangements for coping with extreme hydrological conditions.
USDA	Solid Waste Management Grants	This grant program seeks to reduce or eliminate pollution of water resources and improve planning and management of solid waste disposal facilities in rural areas. Funds may be used to: Evaluate current landfill conditions to determine threats to water resources in rural areas; provide technical assistance and/or training to enhance operator skills in the maintenance and operation of active landfills in rural areas; provide technical assistance and/or training to help associations reduce the solid waste stream; and provide technical assistance and/or training for operators of landfills in rural areas which are closed or will be closed in the near future with the development/implementation of closure plans, future land use plans, safety and maintenance planning, and closure scheduling within permit requirements.
USDA	Water and Waste Disposal Loans and Grants (Section 306C)	Funds from this program may be used to: construct, enlarge, extend, or otherwise improve a community water or waste system; extend service lines and connect individual residences to a system, extend service lines, connect resident's plumbing to system, pay reasonable charges and fees for connecting to system, installation of plumbing and related fixtures, and construction in dwelling of a bathroom.
USDA	Water and Waste Disposal Systems for Rural Communities - ARRA	This program provides basic human amenities, alleviates health hazards and promotes the orderly growth of the rural areas of the nation by meeting the need for new and improved rural water and waste disposal facilities. Funds may be used for the installation, repair, improvement, or expansion of a rural water facility including distribution lines, well pumping facilities and costs related thereto, and the installation, repair, improvement, or expansion of a rural waste disposal facility including the collection, and treatment of sanitary, storm and solid wastes.

Funding Resources

Agency	Funding Name	General Description/Information
USDA	Household Water Well System Grant Program	This program provides grants to private, nonprofit organizations to finance the construction, refurbishing and servicing of individually-owned household water well systems in rural areas for individuals with low or moderate income. Grant funds will be used to establish and maintain a revolving loan fund to provide loans to eligible individuals to construct, refurbish, and service individually-owned household water well systems. Eligible individuals must own or will own the household water well systems.
USDA	Grant Program to Establish a Fund for Financing Water and Wastewater Projects	This program seeks to make grants to private, nonprofit organizations to establish a revolving loan fund to make small, short term loans for pre-development or small capital water or waste disposal projects. Grant funds will be used to establish and maintain a revolving loan fund to finance pre-development costs associated with proposed water and wastewater projects or with existing water and wastewater systems, and short-term costs incurred for replacement equipment, small-scale extension of services, or other small capital projects that are not part of the regular operations and maintenance activities of existing water and wastewater systems.
USDA	Water and Waste Disposal Systems for Rural Communities	This program provides basic human amenities, alleviate health hazards and promote the orderly growth of the rural areas of the nation by meeting the need for new and improved rural water and waste disposal facilities. Funds may be used for the installation, repair, improvement, or expansion of a rural water facility including distribution lines, well pumping facilities and costs related thereto, and the installation, repair, improvement, or expansion of a rural waste disposal facility including the collection, and treatment of sanitary, storm, and solid wastes.
USDA	Emergency Community Water Assistance Grants	Through the Emergency Community Water Assistance Grant Program, the Rural Utilities Service (RUS) is authorized to help rural residents who have experienced a significant decline in quantity or quality of water to obtain adequate quantities of water that meet the standards of the Safe Drinking Water Act. Grant funds may be used to extend waterlines on existing systems; to construct new water lines; to repair existing systems; to perform significant maintenance on existing systems; to construct new wells, reservoirs, transmission lines, treatment plants, storage tanks, etc.; to replace equipment; to provide connection and/or tap fees; to pay costs incurred within six months of the date an application was filed with USDA to correct an emergency situation that would have been eligible for funding under this program; to provide funds for any other appropriate related purposes, such as, legal fees; engineering fees; recording costs; environmental impact analyses; archaeological surveys; possible salvage or other mitigation measures; planning, establishing, or acquiring rights associated with developing sources of treating, storing, or distributing water.
USDA RUS	Water and Waste Disposal Systems for Rural Communities	This program provides monies to provide basic human amenities, alleviate health hazards, and promote the orderly growth of the rural areas of the nation by meeting the need for new and improved rural water and waste disposal facilities. Funds may be used for the installation, repair, improvement, or expansion of a rural water facility including costs of distribution lines and well pumping facilities. Funds also support the installation, repair, improvement, or expansion of a rural waste disposal facility, including the collection and treatment of sanitary waste stream, stormwater, and solid wastes.
RCAP Solutions	RCAP Revolving Loan Fund	The RCAP Revolving Loan Fund (RLF) provides short-term financing to eligible applicants for pre-development costs associated with new water and wastewater projects. RLF financing can also be used for short-term costs incurred for replacement equipment, small-scale extension of services, or other small capital projects for existing water or wastewater systems, costs that are not a part of regular operations and maintenance

Watershed Protection

Agency	Funding Name	General Description/Information
NYCDEP Watershed Protection Program	NYC Watershed Water Quality Improvement Project (WQIP)	This program provides financial assistance, through the NYS Environmental Protection Fund (EPF) for projects that protect and enhance the quality of source waters of the New York City water supply system. Funding is limited to projects within the geographic boundary of the New York City Watershed.
NYCDEP Watershed Protection Program	Statewide WQIP	This program provides funding through the NYS Environmental Protection Fund (EPF) for projects demonstrating direct environmental benefits that will help reduce polluted runoff, improve water quality and restore habitat in New York State waters.
U.S. EPA	Targeted Watershed Grants	To support innovative, community-based watershed approaches aimed at preventing, reducing, or eliminating water pollution. The Targeted Watersheds Grant Program provides resources in the form of grants or cooperative agreements to support watershed organizations in their efforts to expand and improve existing water protection measures. In separate competitive announcements funds are awarded to assist watershed partnerships comprised of State, Tribal, local, and interstate agencies, and public or nonprofit organizations in developing, implementing, and demonstrating: 1) on-the-ground projects to improve or maintain water quality; and 2) organizational and technical capacity building projects to prime organizations to be in a position to implement on-the-ground watershed projects. Funding Priority - Fiscal Year 2010: To build upon the existing activities of watershed organizations to support innovative, wide-reaching plans to restore, preserve, or protect the nation's urban waters through active community engagement.
U.S. EPA	National Estuary Program (NEP)	The National Estuary Program goal is to protect and restore the water quality and estuarine resources of estuaries and associated watersheds designated by the EPA Administrator as estuaries of national significance.
U.S. EPA Office of Water	Assessment and Watershed Protection Program Grants (AWPPG)	The purpose of the AWPPG is to support the coordination and acceleration of research, investigations, experiments, training, demonstrations, surveys, and studies relating to the causes, effects, extent, prevention, reduction, and elimination of water pollution. The two main goals of the Program include supporting a watershed approach to better address water quality problems in the U.S. and building the capacity of all levels of government to develop and implement effective, comprehensive programs for watershed protection, restoration, and management.
USDA	Watershed Protection and Flood Prevention - ARRA	Technical assistance is provided in designing, and installing watershed works of improvement and also for sharing costs of measures for watershed protection, flood prevention, agricultural water management, sedimentation control, public water based fish, wildlife, recreation; municipal and industrial water supply; and in extending long term credit to help local interests with their share of the costs.
USDA NRCS	Watershed Rehabilitation Program	This program provides Federal cost-share funding for the rehabilitation of aging dams that were installed primarily through the Watershed Protection and Flood Prevention Program. The purpose for rehabilitation is to extend the service life of dams and bring them into compliance with applicable safety and performance standards or to decommission the dams so they no longer pose a threat to life and property.
USDA NRCS	Watershed Protection and Flood Prevention Program	This program provides technical and financial assistance to address water resource and related economic problems on a watershed basis. Projects related to watershed protection, flood mitigation, water supply, water quality, erosion and sediment control, wetland creation and restoration, fish and wildlife habitat enhancement, agricultural water conservation, and public recreation are eligible for assistance. Technical and financial assistance is also available for planning new watershed surveys.

Housing

Funding Resources

Agency	Funding Name	General Description/Information
Catskill Watershed Corporation (CWC)	Business District and Historic Structures Rehabilitation Fund	This fund is used to acquire salvageable structures whose owners cannot afford to make needed improvements, and to engage architects and contractors to restore facades and repair and upgrade interiors. The buildings will then be sold for business or mixed commercial and residential use.
NYSERDA	Multifamily Building Performance Program	This program provides an opportunity for businesses providing energy efficiency services to multifamily buildings. The program will address all combinations of market-rate, low- to moderate-income, existing, gut rehabilitation and new construction projects through a common process and a varying schedule of incentives.
NYSERDA	Weatherization Formula Grants - ARRA	This grant provides to assist income-eligible families and individuals by reducing their heating/cooling costs and improving the safety of their homes through energy efficiency measures.
U.S. Department of Housing and Urban Development (HUD)	Supportive Housing for the Elderly	Capital advances may be used to finance the construction or rehabilitation of a structure or portion thereof, or the acquisition of a structure to provide supportive housing for the elderly, which may include the cost of real property acquisition, site improvement, conversion, demolition, relocation and other expenses of supportive housing for the elderly. Project rental assistance is used to cover the difference between the HUD-approved operating cost per unit and the amount the tenant pays.
U.S. Department of Housing and Urban Development (HUD)	Affordable Housing Development in Main Street Rejuvenation Projects	This programs provides to assist small communities (<50,000 persons and <100 Public Housing units) in the rejuvenation of historic or traditional central business districts or "Main Street Areas" by replacing unused commercial space in buildings with affordable housing units. The objectives of the program are to: Redevelop Main Street Areas; Preserve historic or traditional architecture or design features in Main Street Areas; Enhance economic development efforts in Main Street Areas; and, Provide affordable housing in Main Street Areas.
U.S. Department of Housing and Urban Development (HUD)	Community Development Block Grants (CDBG)/Entitlement Grants	The objective of this program is to develop viable urban communities, by providing decent housing and a suitable living environment, and by expanding economic opportunities, principally for persons of low and moderate income. Recipients may undertake a wide range of activities directed toward neighborhood revitalization, economic development and provision of improved community facilities and services.
U.S. Department of Housing and Urban Development (HUD)	Lower Income Housing Assistance Program Section 8 Moderate Rehabilitation	This program provides housing assistance payments to participating owners on behalf of eligible tenants to provide decent, safe and sanitary housing for very low income families at rents they can afford. Housing assistance payments are used to make up the difference between the approved rent due to the owner for the dwelling unit and the occupant family's required contribution towards rent.
U.S. Department of Housing and Urban Development (HUD)	Sustainable Communities Regional Planning Grant Program	This Program supports metropolitan and multi-jurisdictional planning efforts that integrate housing, land use, economic and workforce development, transportation, and infrastructure investments in a manner that empowers jurisdictions to consider the interdependent challenges of economic competitiveness and revitalization; social equity, inclusion, and access to opportunity; energy use and climate change; and, public health and environmental impacts.
USDA	Very Low to Moderate Income Housing Loans	This program assists very low, low-income and moderate-income households to obtain modest, decent, safe and sanitary housing for use as a permanent residence in rural areas.
USDA	Rural Self-Help Housing Technical Assistance	This program provides financial assistance to qualified nonprofit organizations and public bodies that will aid needy very low and low-income individuals and their families to build homes in rural areas by the self help method. Any State, political subdivision, private or public nonprofit corporation is eligible to apply. Grants are used to pay salaries, rent, and office expenses of the nonprofit organization.
USDA	Rural Housing Preservation Grants	To assist very low- and low-income rural residents individual homeowners, rental property owners or by providing the consumer cooperative housing projects (co-ops) the necessary assistance to repair or rehabilitate their dwellings. These objectives will be accomplished through the establishment of repair/rehabilitation, projects run by eligible applicants. This program is intended to make use of and leverage any other available housing programs which provide resources to very low and low-income rural residents to bring their dwellings up to development standards.
USDA	Rural Community Development Initiative	This initiative provides to develop the capacity and ability of private, nonprofit community-based housing and community development organizations, and low income rural communities to improve housing, community facilities, community and economic development projects in rural areas.

Forestry/Agricultural Land

Agency	Funding Name	General Description/Information
Catskill Watershed Corporation (CWC)	Land Acquisition/Sporting Advisory Committee/Local Consultation Program	This program reimburses Towns to review and comment upon proposed purchases of land and easements by the New York City Department of Environmental Protection. Eligible costs include technical and legal review of proposed land purchases by NYC, preparation of comments on proposed land purchases by NYC, consultant expenses, additional in-house municipal staff expenses, or public hearing and legal notice fees.
U.S. Forest Service	Urban and Community Forestry Challenge Cost-Share Grants	This program seeks to establish sustainable urban and community forests by encouraging communities to manage and protect their natural resources. The program works to achieve a number of goals, including: effectively communicating information about the social, economic, and ecological values of urban and community forests; involving diverse resource professionals in urban and community forestry issues; and, supporting a holistic view of urban and community forestry.
USDA	Forest Legacy Program (FLP)	The FLP supports state efforts to protect environmentally sensitive forest lands from the conversion to non-forest uses through the use of conservation easements and fee-simple purchase. It is designed to encourage the protection of privately owned forest lands. The program enables landowners to retain ownership of their land and continue to earn income from it while keeping drinking water safe and clean, conserving valuable open space as well as protecting critical wildlife habitats and outdoor recreation opportunities. The program promotes professional forest management and requires forest management plans. The program emphasizes strategic conservation - working in partnership with States, local communities and non-governmental organizations to make a difference on the land and for communities by conserving areas of unbroken forest, watershed or river corridor forests or by complimenting existing land conservation efforts.
USDA	Forest Health Protection	The purpose of this program is to assist State Foresters, State Plant Regulatory Officials, equivalent State officials, or other official representatives, subdivisions of states, agencies, institutions (public and private), organizations (profit or nonprofit), and individuals on non-Federal lands. Activities include: conducting surveys to detect and assess insect, disease, invasive plant and other stressors; monitoring and reporting on the health of forests and trees; recommending measures to prevent, slow the spread, control, potential, threatening or emergency forest and tree pests; planning, organizing, directing, and performing such measures; providing technical and scientific information, advice, and related assistance; developing applied methods and technology to improve management of forest health; providing information on pesticides and their use; and, promoting implementation of appropriate silvicultural or management techniques to improve forest health.
USDA & U.S. Department of the Interior	Rural Development, Forestry, and Communities	The purpose of this program is to help rural areas analyze and assess forest resource opportunities, maximize local economic potential through market development and expansion, and diversify communities' economic base.

Funding Resources

USDA	Urban and Community Forestry Program	The purpose of this program is to assist in efforts to plan, establish, manage and protect trees, forests, green spaces and related natural resources in and adjacent to cities and towns. The urban forestry program provides ecosystem services, social and economic benefits and links governmental, private and grassroots organizations and resources to improve the quality of life in these cities and towns.
USDA	Forest Land Enhancement Program	Te purpose of this program is to: provide technical and educational assistance; provide cost share for practices such as management plan development, tree planting, forest stand improvement, agro forestry implementation, water quality improvement and watershed protection, fish and wildlife habitat improvement, forest health protection, invasive species control, and wildfire/catastrophic risk reduction and rehabilitation.
USDA National Institute of Food and Agriculture	Agriculture and Food Research Initiative Competitive Grants Program (AFRI)	The Agriculture and Food Research Initiative (AFRI) is a competitive grant program that provides funding for fundamental and applied research, extension and education to address food and agricultural sciences. AFRI supports work in six priority areas: plant health and production and plant products; animal health and production and animal products; food safety, nutrition, and health; renewable energy, natural resources, and environment; agriculture systems and technology; and agriculture economics and rural communities. Types of projects funded to include: single function projects in research, education and extension, and integrated research, education and/or extension awards.
USDA NRCS	Healthy Forests Reserve Program (HFRP)	The HFRP is a voluntary program established for the purpose of restoring and enhancing forest ecosystems to: promote the recovery of threatened and endangered species; improve biodiversity; and, enhance carbon sequestration.
USDA NRCS	Agricultural Management Assistance	Agricultural Management Assistance provides cost share assistance to agricultural producers to voluntarily address issues such as water management, water quality, and erosion control by incorporating conservation into their farming operations. Producers may construct or improve water management structures or irrigation structures; plant trees for windbreaks or to improve water quality; and mitigate risk through production diversification or resource conservation practices, including soil erosion control, integrated pest management, or transition to organic farming.
USDA NRCS	Wildlife Habitat Incentives Program	The Wildlife Habitat Incentives Program is a voluntary program for people who want to develop and improve wildlife habitat on private lands. It provides both technical assistance and cost sharing to help establish and improve fish and wildlife habitat. Participants prepare a wildlife habitat development plan in consultation with a local conservation district.
USDA NRCS	Cooperative Conservation Partnership Initiative (CCPI)	The CCPI is a voluntary conservation initiative that enables the use of certain conservation programs along with resource of eligible partners to provide financial and technical assistance to owners and operators of agricultural and nonindustrial private forest lands.
USDA NRCS	Agricultural Water Enhancement Program (AWEP)	The AWEP is a voluntary conservation initiative that provides financial and technical assistance to agricultural producers to implement agricultural water enhancement activities on agricultural land for the purposes of conserving surface and ground water and improving water quality. It operates through program contracts with producers to plan and implement conservation practices in project areas established through partnership agreements. Under AWEP, the NRCS enters into partnership agreements with eligible entities and organizations that want to promote ground and surface water conservation or improve water quality on agricultural lands.
USDA NRCS	Environmental Quality Incentives Program (EQIP)	The EQIP was established to provide a voluntary conservation program for farmers and ranchers to address significant natural resource needs and objectives. The EQIP offers contracts to provide financial assistance to program participants to implement eligible conservation practices. Persons or legal entities, who are owners of land under agricultural production or who are engaged in livestock or agricultural production on eligible land, including private non-industrial forest land, may participate.
Watershed Agricultural Council	Conservation Reserve Enhancement Program (CREP)	The CREP is a voluntary land retirement program that helps agricultural producers protect environmentally sensitive land, decrease erosion, restore wildlife habitat, and safeguard ground and surface water.
Watershed Agricultural Council	Forest Management Planning Program	This program encourages voluntary stewardship of private forest land, the Watershed Forestry Program offers cost-sharing to landowners with parcels of ten acres and above located within the watershed boundaries who currently have no written plan.
Watershed Agricultural Council	WAC Easement Stewardship Program	This program offers landowners an option to permanently conserve their land. Under an easement, landowners work the land as they always have. In addition, they may mortgage it, sell it, or leave it to their heirs. The easement remains intact even as the property changes hands.

Jobs/Business/Economic/Community Development

Agency	Funding Name	General Description/Information
Catskill Watershed Corporation (CWC)	Catskill Fund for the Future (CFF)/Economic Development Programs	The programs are intended to support environmentally responsible businesses and to create and retain jobs in the Catskills to help offset impacts of New York City Watershed regulations and the City's acquisition of thousands of acres of land which will remain off limits to development.
Catskill Watershed Corporation (CWC)	Regional Economic Development Initiative (REDI)	Loans are available to help existing or proposed businesses start, relocate, expand, consolidate or improve operations within the Catskill Watershed region in an environmentally sound manner. Any for-profit business or corporation or non-profit organization planning a project which is deemed a Qualified Economic Development Project (one which encourages the twin goals of Watershed protection and job creation/retention), is eligible to apply for a low-interest loan.
Catskill Watershed Corporation (CWC)	Business District and Historic Structures Rehabilitation Fund	This fund is used to acquire salvageable structures whose owners cannot afford to make needed improvements, and to engage architects and contractors to restore facades and repair and upgrade interiors. The buildings will then be sold for business or mixed commercial and residential use.
Catskill Watershed Corporation (CWC)	Local Technical Assistance Program (LTAP)	The purpose of the LTAP is to encourage development of community planning initiatives in the West-of-Hudson Watershed.
Environmental Facilities Corporation (EFC)	Green Innovation Grant Program (GIGP)	The GIGP program is designed to preserve and create jobs, promote economic recovery and invest in environmental protection that will provide economic benefits to the State of New York.
Environmental Facilities Corporation (EFC)	Small Business Environmental Assistance Program	This program provides free, confidential technical assistance to small businesses in New York State to help them comply with federal or State air emission requirements.
Federal Emergency Management Agency (FEMA)	Fire Station Construction Grant Program - ARRA	This program is intended to create or save jobs in recession-hit areas and achieve other purposes stated in ARRA, and achieve AFG goals of firefighter safety and improved response capability/capacity based on need through the construction, renovation or modification of fire stations. Eligible entities include Non-Federal Fire Departments and state and local governments that fund/operate fire departments.
NYS's Empire State Development	New Markets Tax Credits Program - ARRA	This program subsidizes long-term capital investment in order to foster job creation and community development in Low-Income Communities throughout New York State. Empire State Development has available interest-only loans at below-market rates, a portion of which may be forgiven upon maturity.

Funding Resources

NYS's Empire State Development	Environmental Investment Program (EIP)	The EIP helps businesses capture the economic benefits associated with pollution prevention, waste reduction, re-use and recycling. The EIP also includes the Scrap Tire Market Development Program which helps businesses develop new products and processing technologies that create value-added uses for waste tire material. Eligible applicants include not-for-profits, Industrial Development Agencies or municipalities on behalf of New York State manufacturers, recyclers, other businesses or non-profits that will achieve substantial waste prevention, recycling or toxic reductions.
U.S. Department of Commerce	Investments for Public Works and Economic Development Facilities - ARRA	Public Works grants support the construction/rehabilitation of essential public infrastructure and facilities necessary to generate or retain private sector jobs and investments, attract private sector capital, and promote regional competitiveness, innovation, and entrepreneurship, including investments that expand and upgrade infrastructure to attract new industry, support technology-led development, accelerate new business development, and enhance the ability of regions to capitalize on opportunities presented by free trade.
U.S. Department of Commerce	Economic Development Technical Assistance	Technical assistance is used to provide information, data, and know-how in evaluating, shaping and implementing specific projects and programs that promote economic development in economically distressed regions. EDA may identify specific training, research or technical assistance Projects it will fund under National Technical Assistance, which will be subject to competition.
U.S. Department of Commerce	Economic Development Support for Planning Organizations	Planning investment assistance helps bear the direct and indirect costs incurred by a Planning Organization in developing and implementing a community economic development strategy. Planning activities supported by these Investments must be part of a continuous process involving the active participation of Private Sector Representatives, public officials and private citizens.
U.S. Department of Commerce	Investments for Economic Adjustment Assistance (EAA)	This program provides a wide range of technical, planning, and public works and infrastructure assistance in regions experiencing adverse economic changes that may occur suddenly or over time (e.g., strategy development, infrastructure construction, revolving loan fund capitalization).
U.S. Department of Commerce Economic Development Administration	Public Works and Development Facilities Program	This program provides assistance to help distressed communities attract new industry, encourage business expansion, diversify local economies and generate long-term, private sector jobs. Among the types of projects funded are water and sewer facilities, primarily serving industry and commerce; access roads to industrial parks or sites; port improvements; business incubator facilities; technology infrastructure; sustainable development activities; export programs; brownfield redevelopment; and, aquaculture facilities. Specific activities may include demolition, renovation, and construction of public facilities; provision of water or sewer infrastructure; or the development of stormwater control mechanisms (e.g., a retention pond) as part of an industrial park or other eligible project.
USDA	Rural Cooperative Development Grants	These grants seek to improve economic conditions in rural areas through cooperative development. The primary objective is to provide technical assistance services, including feasibility analysis. The grant program will be used to facilitate the creation or retention of jobs in rural areas through the development of new rural cooperatives, value-added processing, and rural businesses.
USDA NRCS	Conservation Innovation Grants (CIG)	Conservation Innovation Grants (CIG) is a voluntary program intended to stimulate the development and adoption of innovative conservation approaches and technologies while leveraging the Federal investment in environmental enhancement and protection, in conjunction with agricultural production. Funds are used to award competitive grants to non-Federal governmental or non-governmental organizations, federally-recognized Tribes, or individuals.
Greene County Department of Economic Development, Tourism and Planning	Quantum Fund	Quantum Fund loans are available for up to 50% of the funding needed for a business expansion. Each borrower must create at least one permanent full time job (or its equivalent) for each $20,000 loaned from the Quantum fund.
Greene County Department of Economic Development, Tourism and Planning	Microenterprise Assistance Program (MAP)	The Greene County MAP assists in the establishment and expansion of small businesses that are start-ups or have five or fewer employees, one of which is the owner, and the creation of new jobs through business training, funding and technical assistance. All business sectors, including industry, retail, services, agriculture and tourism, are eligible for the program. Low-interest loans and deferred-payment loans can be used for acquisition, renovation, working capital, furniture, fixtures, equipment or any other reasonable business expense.
Greene County Department of Economic Development, Tourism and Planning	Main Street Revitalization Program	The Main Street Revitalization Program (MSRP) offers matching grants covering up to 50% of a project's cost as well as technical assistance for improvements along traditional Main Streets throughout Greene County. Greene County also works with local municipalities to create Main Street Development Strategies for revitalization and redevelopment. Technical assistance and cost-sharing is provided through Greene County Economic Development, Tourism and Planning for consultant selection and the creation of the strategies
Greene County Department of Economic Development, Tourism and Planning	Workforce Homeownership Program	Workforce Homeownership Program to help income-eligible people who either live or work in the county to purchase their first homes at a significantly reduced cost.
USDA	Small Business Innovation Research Program	The purpose of the SBIR program is to provide an opportunity for US-owned, for-profit small business firms to submit innovative, applied, research and development projects that address important problems facing American agriculture and have the potential to lead to significant public benefit if the research is successful. Research proposals are accepted in any of the following topic areas: Forests and Related Resources; Plant Production and Protection - Biology; Animal Production and Protection; Air, Water, and Soils; Food Science and Nutrition; Rural Development; Aquaculture; Biofuels and Biobased Products; Marketing and Trade; Animal Manure Management; Small and Mid-Size Farms; and, Plant Production and Protection - Engineering.
USDA	Rural Business Enterprise Grants - ARRA	Rural business enterprise grant (RBEG) funds may be used to create, expand or operate rural distance learning networks or programs that provide educational or job training instruction related to potential employment or job advancement to adult students; develop, construct or acquire land, buildings, plants, equipment, access streets and roads, parking areas, utility extensions, necessary water supply and waste disposal facilities; refinancing; services and fees; and to establish a revolving loan fund. All uses must assist a small and emerging private business enterprise

Wetlands

Agency	Funding Name	General Description/Information
U.S. Department of the Interior U.S. Fish and Wildlife Service Division of Bird Habitat Conservation	North American Wetlands Conservation Act Grants Program	The U.S. Fish and Wildlife Service's Division of Bird Habitat Conservation administers this grant program to carry out wetlands and associated uplands conservation projects in the United States, Canada, and Mexico. Conservation activities supported by the Act in the United States and Canada include habitat protection, restoration, and enhancement.

Funding Resources

Agency	Funding Name	General Description/Information
U.S. EPA	Wetlands Program Development Grants	The EPA's Wetland Program Development Grants are intended to encourage comprehensive wetlands program development by promoting the coordination and acceleration of research, investigations, experiments, training, demonstrations, surveys, and studies relating to the causes, effects, extent, prevention, reduction, and elimination of water pollution. Projects build the capacity of states, tribes, and local governments to effectively protect wetland and riparian resources. Projects funded under this program support the initial development of a wetlands protection, restoration or management program or support enhancement/refinement of an existing program.
U.S. EPA Office of Water	Regional Wetland Program Development Grant	The purpose of this program is to assist State, Tribal, local government agencies and interstate/intertribal entities in building programs which protect, manage, and restore wetlands. The primary focus of the grant is to build state and tribal wetland programs. A secondary focus is to build local (e.g. county or municipal) programs.
USDA NRCS	Wetlands Reserve Program	This program provides landowners with financial incentives to restore and protect wetlands in exchange for retiring marginal agricultural land. To participate in the program landowners may sell a conservation easement or enter into a cost-share restoration agreement (landowners voluntarily limit future use of the land, but retain private ownership). Landowners and the NRCS jointly develop a plan for the restoration and maintenance of the wetland.

Misc.

Agency	Funding Name	General Description/Information
Catskill Watershed Corporation (CWC)	Institutional Sand and Salt Program	This program provides funding to improve storage facilities for road de-icing materials at hospitals, schools and other institutions in the New York City Watershed (West of the Hudson River). CWC reimburses institutions for the design, construction, upgrading, or replacing of storage facilities at schools, universities, hospitals, nursing homes, churches and children's camps licensed by New York State. Institutions that store 1,000 pounds or more of winter maintenance material within the Watershed are eligible to apply for funds.
Catskill Watershed Corporation (CWC)	Tax Consulting Program	This program pays the fees and expenses of consultants and/or attorneys retained by NYC Watershed municipalities to review, analyze or assist in the administration of property taxes paid by NYC on City-owned lands and facilities in the West-of-Hudson Watershed.
National Fish and Wildlife Foundation (NFWF)	Pulling Together Initiative (PTI)	The PTI provides a means for federal agencies to partner with state and local agencies, private landowners, and other interested parties to develop long-term weed management projects within the scope of an integrated pest management strategy. The goals of PTI are: to prevent, manage, or eradicate invasive and noxious plants through a coordinated program of public/private partnerships; and, to increase public awareness of the adverse impacts of invasive and noxious plants. The PTI provides support on a competitive basis for the formation of local weed management area (WMA) partnerships, allowing them to demonstrate successful collaborative efforts and develop permanent funding sources for the maintenance of WMAs from the involved parties. Successful projects will serve to increase public awareness and interest in future partnership projects.
U.S. Department of Health and Human Services	Special Programs for the Aging - ARRA*	Funds are used to support the development and testing of innovative programs, services and systems of support that respond to the needs of the nations growing elderly population, to improve knowledge of the problems and needs of the elderly, to help ensure adequately trained personnel in the field of aging, and to demonstrate better ways of improving the quality of life for the elderly.
U.S. Department of the Interior	National Register of Historic Places	The purpose of this program is to expand and maintain the National Register of Historic Places for planning, preservation, research, public education and tourism efforts; to make the information on districts, sites, buildings, structures and objects of historical, architectural, archeological, engineering and cultural significance more accessible to the public in order to increase and broaden the public's understanding of the information, foster a national preservation ethic, and to promote greater appreciation of America's heritage; to coordinate with Federal agencies, State and Tribal preservation offices, and the Advisory Council on Historic Preservation in the implementation of laws and policies pertaining to historic preservation; and to establish liaison with and give guidance to communities under Title I of the Housing and Community Development Act of 1974 (see 14.218).
U.S. Department of Transportation	State and Community Highway Safety	This program provides a coordinated national highway safety program to reduce traffic crashes, deaths, injuries, and property damage.
U.S. EPA	Community Action for a Renewed Environment (CARE) Program	To support analyses, studies, evaluations, surveys, investigations, conferences, demonstrations and special purpose projects which empower communities to reduce risks from exposures to toxic pollutants in the air, in the water, and on the land through collaborative action at the local level.
U.S. EPA	Environmental Justice Grants Program	This program supports environmental education projects that enhance the public's awareness, knowledge, and skills to help people make informed decisions that affect environmental quality.
U.S. EPA	Environmental Education Grants	This program provides funding for the following educational priorities: Capacity Building - Increasing capacity to develop and deliver coordinated environmental education programs across a state or across multiple states; Education Reform - Utilizing environmental education as a catalyst to advance state, local, or tribal education reform goals; Community Issues - Designing and implementing model projects to educate the public about environmental issues and/or health issues in their communities through community-based organizations or through print, film, broadcast, or other media; Health - Educating teachers, students, parents, community leaders, or the public about human-health threats from environmental pollution, especially as it affects children, and how to minimize human exposure to preserve good health; Teaching Skills - Educating teachers, faculty, or non-formal educators about environmental issues to improve their environmental education teaching skills, e.g., through workshops; or, Career Development - Educating students in formal or non-formal settings about environmental issues to encourage environmental careers.
U.S. EPA	Pesticide Environmental Stewardship Grants	EPA's Pesticide Environmental Stewardship Program offers grants to support the reduction of risks from pesticides in agricultural and non-agricultural settings, and to implement pollution prevention measures. All organizations with a commitment to pesticide risk reduction are eligible to join as members, either as Partners or as Supporters.
U.S. EPA Office of Air and Radiation	Climate Showcase Communities Grant Program	The goal of this grant program is to create replicable models of sustainable community action that generate cost-effective and persistent greenhouse gas reductions while improving the environmental, economic, public health, or social conditions in a community.
USDA	Soil and Water Conservation	Provide conservation technical assistance to private landowners, conservation districts, tribes, and other organizations through a national network of locally-respected, technically-skilled, professional conservationists and assist them in conserving, improving and sustaining our natural resources and environment.
USDA	Capital Improvement and Maintenance - ARRA	Funds from this program are provided for priority road, bridge and trail maintenance and decommissioning, including related watershed restoration and ecosystem enhancement projects; facilities improvement, maintenance and renovation; and remediation of abandoned mine sites.
NYSDOT	Consolidated Local Street and Highway Improvement Program (CHIPS)	The purpose of this program is to assist localities in financing the construction, reconstruction, or improvement of local highways, bridges, highway-railroad crossings, and/or other local facilities.

Funding Resources

American Planning Association	Grants for Small Town and Rural (STAR) Area Projects	The STAR program is for any community organization, local not-for-profit, government agency, student group, or individual to assist with getting a project, program, study, activity, or initiative off the ground.
USDA	Small Business Innovation Research Program	The purpose of the SBIR program is to provide an opportunity for US-owned, for-profit small business firms to submit innovative, applied, research and development projects that address important problems facing American agriculture and have the potential to lead to significant public benefit if the research is successful. Research proposals are accepted in any of the following topic areas: Forests and Related Resources; Plant Production and Protection - Biology; Animal Production and Protection; Air, Water, and Soils; Food Science and Nutrition; Rural Development; Aquaculture; Biofuels and Biobased Products; Marketing and Trade; Animal Manure Management; Small and Mid-Size Farms; and, Plant Production and Protection - Engineering.
U.S. Department of the Interior	National Fire Plan - Wildland Urban Interface Community Fire Assistance	The RFA program provides funds for RFDs that: Protect rural, wildland-urban interface communities; Play a substantial cooperative role in the protection of federal lands; Are cooperators with the Department of the Interior (DOI) managed lands through cooperative agreements with the DOI, or their respective state, tribe, or equivalent; Are less than 10,000 in population.
USDA	Community Facilities Loans and Grants	Community Facilities loans and grants can be used to construct, enlarge, extend or otherwise improve community facilities providing essential services to rural residents. This can include costs to acquire land, pay professional fees and purchase equipment.

Wildlife/Habitat/Outdoor Recreation

Agency	Funding Name	General Description/Information
National Fish and Wildlife Foundation (NFWF)	Bring Back the Natives Grant Program (BBN)	The BBN funds on-the-ground efforts to restore native aquatic species to their historic range. Projects involve partnerships between communities, agencies, private landowners, and organizations that seek to rehabilitate streamside and watershed habitats. Projects should focus on habitat needs of species such as fish, invertebrates, and amphibians that originally inhabited the waterways across the country. Funding for the BBN is administered through NFWF from federal agencies cooperating to support this program. Cooperating agencies and organizations include the US Fish and Wildlife Service, Bureau of Land Management, USDA Forest Service and Trout Unlimited.
National Fish and Wildlife Foundation (NFWF)	Native Plant Conservation Initiative	The Native Plant Conservation Initiative supports on-the-ground conservation projects that protect, enhance and/or restore native plant communities on public and private land. Projects typically fall into one of three categories and may contain elements of each: protection and restoration; information and education; and, inventory and assessment. Applicants are encouraged, when appropriate, to include a pollinator component in their project.
U.S. Department of the Interior	Rivers, Trails and Conservation Assistance	The Rivers, Trails and Conservation Assistance Program implements the natural resource conservation and outdoor recreation mission of the National Park Service in communities across America. The program will help create local, regional and state networks of parks, rivers, trails, greenways and open spaces by collaborating with community partners and National Park areas.
U.S. Department of the Interior	Visitor Facility Enhancements - Vehicle Pullouts, Interpretive Trails and Kiosks	This program encourages partnerships with interested parties to enhance wildlife viewing opportunities for the public. Projects must conserve, protect and enhance fish, wildlife and plants for the continuing benefit to the public. Funds may be used for approved projects on Service lands that enhance wildlife viewing opportunities for the public while providing access in the form of interpretive pullouts, trails, and interpretive kiosks which provide a public benefit.
U.S. Department of the Interior	Habitat Enhancement, Restoration and Improvement - ARRA	Assistance is provided to fund projects that improve habitat or any related activity necessary to accomplish this goal. Funds maybe used for habitat assessments, protection and restoration of public and private land that include alternative/renewable energy efficient projects. Funds may also be used to encourage public usage of providing access, education, providing fish passage and stocking of fish from National or State Fish Hatcheries, and advising on wildlife management techniques. Working with interns on habitat restoration projects is acceptable.
U.S. Department of the Interior	Recreation Resources Management - ARRA	This program provides opportunities for public recreation at Bureau of Reclamation or other publicly-owned water projects, and to encourage State, county, and local governments to fund and manage recreation resources at these project areas.
REI	REI Grant Program	REI's grant program seeks to engage communities--especially youth--in outdoor recreational activities and active stewardship of the environment. Therefore, REI's grants support efforts to make outdoor activities welcoming and accessible to all people and promote stewardship of the outdoors.
U.S. Department of the Interior U.S. Fish and Wildlife Service	Partners for Fish and Wildlife Program	This program provides technical and financial assistance to private landowners to restore fish and wildlife habitats on their lands.
U.S. Department of the Interior U.S. Fish and Wildlife Service	Landowner Incentive Program (LIP)	The LIP provides competitive matching grants to states, territories, and the District of Columbia to establish or supplement landowner incentive programs. These programs provide technical and financial assistance to private landowners for projects that protect and restore habitats of listed species or species determined to be at-risk. LIP projects will likely involve activities such as the restoration of marginal farmlands to wetlands, the removal of exotic plants to restore natural prairies, a change in grazing practices and fencing to enhance important riparian habitats, instream structural improvements to benefit aquatic species, road closures to protect habitats and reduce harassment of wildlife, and acquisition of conservation easements. Although not directly eligible for these grants, third parties such as nonprofit organizations may benefit from these funds by working directly with their states to see if either grants or partnering opportunities are available.
U.S. Department of the Interior National Park Service	Rivers, Trails, and Conservation Assistance (RTCA)	The Rivers, Trails and Conservation Assistance Program implements the natural resource conservation and outdoor recreation mission of the National Park Service in communities across America. RTCA will help create local, regional and state networks of parks, rivers, trails, greenways and open spaces by collaborating with community partners and National Park areas in every state. Support comes in the form of advisory services and assistance.
U.S. Department of the Interior National Park Service, Recreation Programs	Land and Water Conservation Fund (Outdoor Recreation, Acquisition, Development and Planning Grants)	The purpose of this program is to provide financial assistance to the States and their political subdivisions for the preparation of Statewide Comprehensive Outdoor Recreation Plans and acquisition and development of outdoor recreation areas and facilities for the general public, to meet current and future needs.
U.S. EPA	Source Reduction Assistance Grant Program	This program provides grants and cooperative agreements to fund pollution prevention (source reduction and resource conservation) activities. Specifically, projects that help reduce hazardous substances, pollutants, or contaminants entering waste streams or otherwise released into the environment (including fugitive emissions) prior to recycling, treatment, disposal or energy recovery activities.
U.S. EPA	Five-Star Restoration Program	The EPA supports the Five-Star Restoration Program by providing funds to the National Fish and Wildlife Foundation and its partners, the National Association of Counties, NOAA's Community-based Restoration Program and the Wildlife Habitat Council. These groups then make sub grants to support community-based wetland and riparian restoration projects. Competitive projects will have a strong on-the-ground habitat restoration component that provides long-term ecological, educational, and/or socioeconomic benefits to the people and their community. Projects must involve contributions from multiple and diverse partners, including citizen volunteer organizations, corporations, private landowners, local conservation organizations, youth groups, charitable foundations, and other federal, state, and tribal agencies and local governments.

Funding Resources

U.S. EPA Office of Water	Environmental Policy and Innovation Grants	This program supports analyses, studies, evaluations, workshops, conferences, and demonstration projects that lead to reduced pollutants generated and conservation of natural resources; It seeks to improve economic information and analytic methods to support studies, surveys, analyses, evaluations, conferences, workshops, and demonstration projects on the benefits, costs, and impacts of environmental programs and to improve economic information and analytic methods to support studies, surveys, analyses, evaluations, conferences, workshops, and demonstration projects of incentive-based and voluntary environmental management strategies and mechanisms The program supports research to explore and develop strategies and mechanisms for those in the economic, social, governmental, and environmental arenas to use in environmental management decisions.
USDA	Watershed Restoration and Enhancement Agreement Authority	The Authority provides domestic cooperative agreements with willing participants for the protection, restoration, and enhancement of fish and wildlife habitat and other resources on public or private land and for the reduction of risk from natural disaster where public safety is threatened that benefit these resources within the watershed.

* ARRA = American Recovery and Reinvestment Act

See:
https://www.cfda.gov
www.grants.gov
http://www.recovery.gov
http://www.usgs.gov/contracts/grants/
http://www.nan.usace.army.mil/index.php
http://www.nal.usda.gov/ric/ricpubs/fundguide.html
for additional funding opportunities