

Environmental Stewardship in Carroll County



2017

Carroll County has long been a leader in the State with programs, policies, and regulations that demonstrate our dedication and commitment to environmental stewardship.

Commissioners' Environmental Principles

In October 2011, the Board of County Commissioners adopted a set of environmental principles to emphasize the County's commitment to environmental stewardship. The Board's support for clean air, land, and water was detailed in its vision. (See sidebar)

Carroll County Master Plan Goals

The adopted Carroll County Master Plan seeks a holistic approach to protection of environmental resources by incorporating stewardship into other activities and policies, as demonstrated by incorporation of environmental stewardship into more than half of its goals. For more details, view the Master Plan at <http://ccgovernment.carr.org/ccg/complanning/MasterPlan/2014/>.

Environmental Goals in Master Plan

Goal 3 ♦ Protect and enhance the water quality of Carroll County's rivers, streams, reservoirs, and aquifers; comply with applicable state and federal requirements related to water quality and quantity; and maintain and protect adequate water supplies to serve current and planned development.

Goal 7 ♦ Preserve at least 100,000 acres of agricultural land to support the production of agricultural products and promotion of related agribusiness.

Goal 8 ♦ Preserve 80 percent of undeveloped land in the Priority Preservation Area, as adopted by the Board of County Commissioners.

Goal 9 ♦ Provide an affordable, coordinated and comprehensive system of public and private parks, recreational facilities and programs, and open space that will enhance our communities.

Goal 11 ♦ Protect, maintain, and restore, where feasible, the environmental resources and natural ecosystems in the County by promoting land use practices that are in balance with, and minimize the effects on the natural environment, subject to appropriate cost/benefit analysis.

Goal 12 ♦ Protect certain mineral resources of current and future economic importance from preemptive land uses and to ensure availability for recovery in a manner that minimizes impacts to surrounding areas; and for reclamation purposes, assure recovery to an environmentally sensitive, aesthetically pleasing condition.

Goal 14 ♦ Facilitate a development pattern that remains consistent with the fabric of our communities, is in harmony with the surrounding built and natural environments, encourages community interaction and, in rural areas, preserves the County's rural character.

Goal 15 ♦ Pursue policies that facilitate development in appropriate areas, including the Designated Growth Areas, thereby protecting and conserving agricultural and environmental resources, preserving open space, and providing public facilities and services efficiently and cost-effectively.

Commissioners' Environmental Principles

1. Maintain and improve environmental quality and encourage economic prosperity while preserving the county's rural character.
2. Promote land use, planning, and development concepts and practices that support citizens' health, safety, well-being, individual rights and the economic viability of Carroll County.
3. Maintain safe and adequate drinking water and other water supplies including efforts to protect and restore the Chesapeake Bay.
4. Strive to protect our natural resources for future generations.

Land Conservation & Preservation



Carroll County has a rich tradition of agriculture that continues to be strong today and continues to support agriculture as the county's number one industry. The countywide desire to preserve the farming way of life and support agricultural industries has resulted in tremendous rates of participation in one of the most successful agricultural land preservation programs in the country. **Carroll ranks among the top county programs in the United States with the number of acres preserved through conservation easements¹.** The preservation of the agricultural industry in the county is strengthened through conservation of intermingled lands steeped in natural resources. Carroll County landowners have voluntarily placed easements on over 70,311 acres of land, limiting their development rights and thus ensuring that the land will be farmed for generations to come. Each acre of land under an easement also helps to preserve the rural character of the county which is so often imperiled by increased development and the diminished ability of farmers to continue farming as a result of development's side effects.

From FY 1980 through FY 2017, 70,311 acres were permanently preserved through easement programs, which is roughly 1/4 of the total county land area.

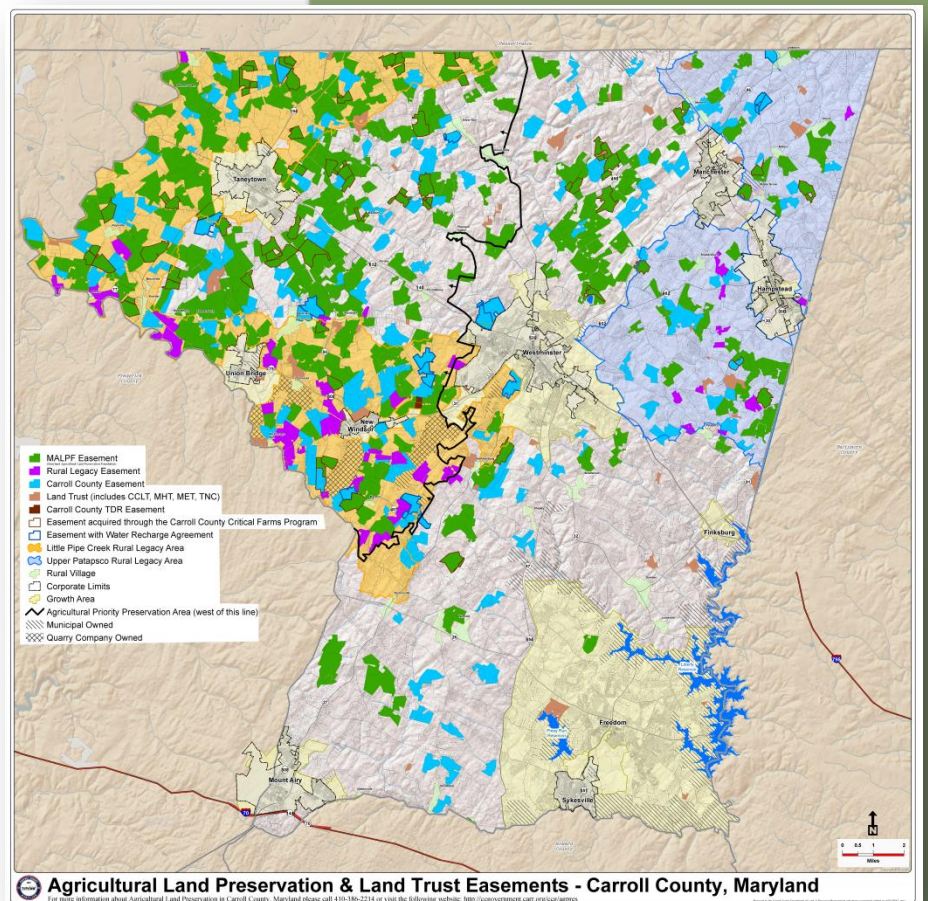
Agricultural Land Preservation Program

Carroll County Agricultural Land Preservation Program 410-386-2214
<http://ccgovernent.carr.org/ccg/aqpres/>
carrollaqpres@ccg.carr.org

Program	Acres Preserved	\$ Spent
MALPF	43,419	\$50,326,735
Carroll County	20,191	\$146,254,202
Rural Legacy	4,229	\$17,520,779
Land Trusts & Conservancies	2,472	\$1,704,292
Totals	70,311	\$215,806,007

One of Carroll's best-known success stories is its Agricultural Land Preservation Program. The community has long recognized the benefits to be reaped through ensuring the continuance of the strong agro-economy. For many decades, Boards of County Commissioners have consistently supported the County's **goal of preserving 100,000 acres of farmland**, as demonstrated through the continued funding, staff, and other resources needed. The County's diverse programs and approaches to preservation and payment options continue to ensure land is available to support a viable agricultural industry, while also promoting the county's heritage, protecting environmental resources, and maintaining the aesthetic charm and way of life so many enjoy. Preservation programs contributing to Carroll's success include:

- ♦ Maryland Agricultural Land Preservation Foundation (MALPF)
- ♦ Carroll County Agricultural Land





Preservation Program

- Water Recharge Credit
- ♦ Carroll County Critical Farms Program
- ♦ Rural Legacy Program, with two delineated Rural Legacy Areas (Little Pipe Creek and Upper Patapsco)
- ♦ Participation of Land Trusts and Conservancies, such as the Carroll County Land Trust, Maryland Environmental Trust, and The Nature Conservancy.

Water Recharge Credit

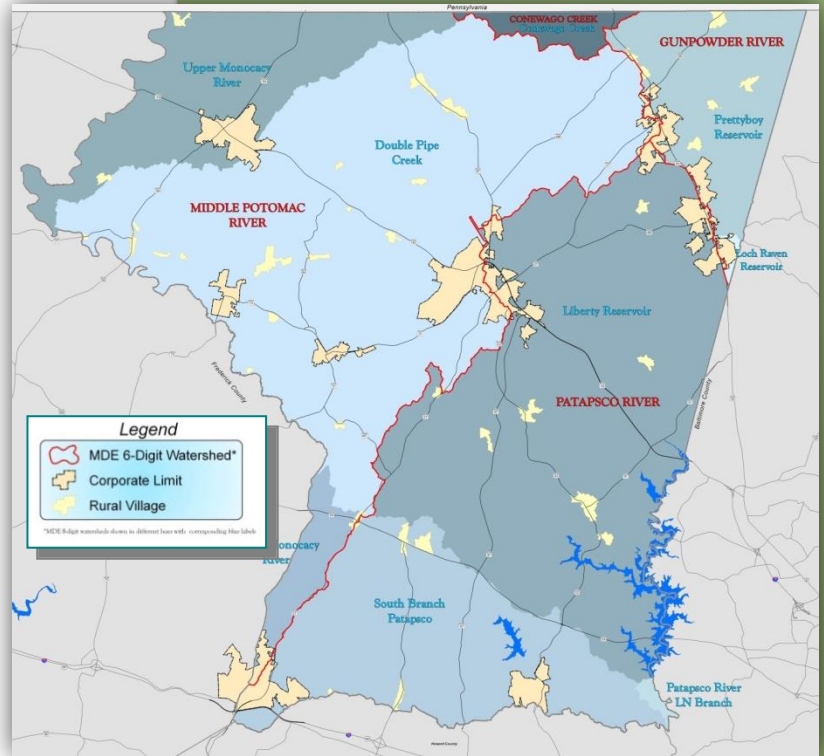
In Carroll County, water recharge credits have become a tool for offsetting water requirements for development and permanently protecting undeveloped land. Maryland Department of Environment (MDE) regulates the appropriation of water to landowners and municipalities based on recharge rates, or amount of rainfall that reenters the aquifer. MDE appropriations are made conservative through the consideration of drought recharge and periods of low stream flow.

Municipalities across the Piedmont, due to MDE requirements, only have enough recharge to develop at 1-2 units per acre, rather than the 3.5 dwelling units per acre prescribed for Priority Funding Areas. Municipalities can only claim recharge from land they own and control.

Carroll County implemented a program to offer water recharge credits, as a provision of the Agricultural Land Preservation Easements, by which groundwater recharge on farms is protected in perpetuity and then the water appropriation is transferred to municipalities to develop at Smart Growth densities. These credits are included as part of the conservation easement acquired through the Agricultural Land Preservation Program. Farms suitable for water recharge credits are selected strategically for their location, geology, high recharge capacity, and current agricultural operations. As of June 2017, **Carroll has acquired recharge credits on 2,955 acres through 18 conservation easements.**

Rural Legacy Areas (RLAs)

Two locally designated Rural Legacy Areas – Little Pipe Creek and Upper Patapsco – encompass 58,526 and 39,198 acres, respectively, of land eligible for participating in this State program. Greenbelts of forests and farms around rural communities are intended to preserve their cultural heritage; to preserve critical habitat for native plant and wildlife species; to support natural resource economies such as farming, forestry, tourism and outdoor recreation; to protect riparian forests, wetlands, and greenways to buffer tributaries of the Chesapeake Bay from pollution runoff. The County contributes funds toward the purchase of RLA easements.



Carroll County drains to 9 different watersheds:

- ♦ *Upper Monocacy River*
- ♦ *Conewago Creek*
- ♦ *Prettyboy Reservoir*
- ♦ *Double Pipe Creek*
- ♦ *Liberty Reservoir*
- ♦ *Loch Raven Reservoir*
- ♦ *Lower Monocacy River*
- ♦ *South Branch Patapsco River*
- ♦ *Lower North Branch Patapsco River*

Agriculture Programs & Best Management Practices (BMPs)

Soil Conservation Partnership/Maryland Agricultural Water Quality Cost-Share Program (MACS)

Carroll County farmers have a long, proud tradition of voluntary participation and installation of BMPs cost-shared by MACS. Even though Maryland's revised nutrient management regulations now mandate many of these BMPs, participation in the MACS program is voluntary. **Farmers who receive cost-share grants from MACS still invest additional funds themselves** in projects to protect natural resources on their farms, adopt sustainable farm management practices, and comply with Maryland's revised nutrient management regulations.²

Nutrient Management Plans

Farmers are required to follow nutrient management plans when fertilizing crops and managing animal waste. These plans specify how much fertilizer, manure, or other nutrient sources may be safely applied to crops to achieve yields and prevent excess nutrients from impacting waterways. These plans generally are required for all agricultural land used to produce plants, food, feed, fiber, animals, or other agricultural products. Maryland's updated regulations now require farmers to establish setback areas next to waterways.²

Conservation Resource Enhancement Program (CREP)

CREP is a federal-state program that pays landowners to take environmentally sensitive cropland out of production for 10 to 15 years and to install conservation practices that protect water quality and provide wildlife habitat. In Fiscal Year (FY) **2016, 35 CREP projects** were completed in Carroll County with \$109,729 in cost-share grants to install stream protection measures.²

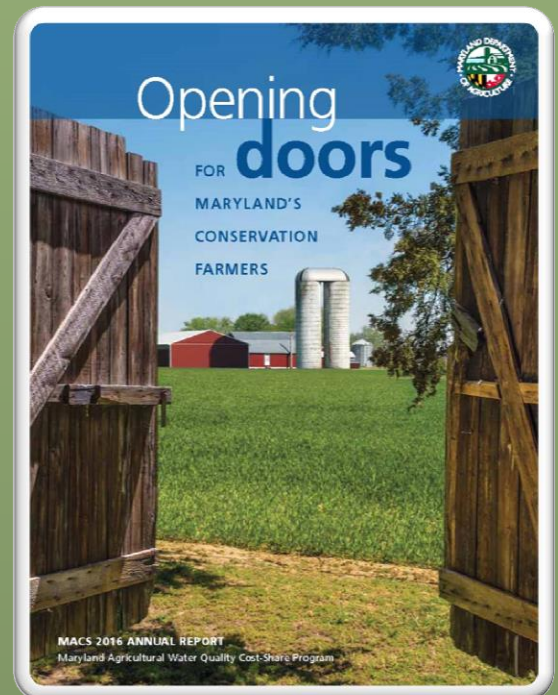
Best Management Practices (BMPs) Installed

In FY 2016, the program provided almost **\$1.7 million** in capital funds for Carroll County farmers to invest in installing **131 conservation projects** on their farms to control soil erosion, to reduce nutrient runoff, and to improve water quality. For FY 2016, Carroll County farmers **received the highest payment and number of projects of all Maryland counties.**²

Cover Crops

Farmers who plant certain cover crops on harvested crop fields in the fall help to recycle residual plant nutrients, to protect against wind and water erosion, and to improve soil for next year's crop. Cover crops help to prevent nitrogen and phosphorus from reaching the Bay. In **FY 2016**, through participating in MACS alone, Carroll County farms planted **over 32,065 acres of cover crops.**

August 1, 2017



All information in this section is directly from the Maryland Agricultural Water Quality Cost-Share Program, *Opening Doors for Maryland's Conservation Farmers: 2016 Annual Report*. Maryland Department of Agriculture.

http://mda.maryland.gov/resource_conservation/counties/MACS_FINAL.pdf

Natural Resources Conservation Service (NRCS)

Maryland NRCS of the U.S. Department of Agriculture assists private landowners with voluntary efforts to reduce soil erosion, enhance water supplies, improve water quality, increase wildlife habitat, and reduce damages caused by floods and other natural disasters through technical assistance, cost shares, and financial incentives. In 2014, the Farm Bill was enacted. NRCS offers voluntary Farm Bill conservation programs that benefit both agricultural producers and the environment, summarized below from the [USDA NRCS Maryland website](#).

Regional Conservation Partnership Program (RCPP)

The RCPP encourages partners to join in efforts with producers to increase the restoration and sustainable use of soil, water, wildlife, and related natural resources on regional or watershed scales. Through the program, NRCS and its partners help producers install and maintain conservation activities in selected project areas. Partners leverage RCPP funding in project areas and report on the benefits achieved. (Source: [USDA NRCS website](#))

Environmental Quality Incentives Program (EQIP)

EQIP helps agricultural producers promote agricultural production and environmental quality as compatible goals. Through EQIP, farmers receive financial and technical assistance to implement structural and management conservation practices that optimize environmental benefits on working agricultural land. Priorities include reducing nonpoint source pollution; conserving ground and surface water resources; reducing emissions and ozone precursors and depleters; reducing soil erosion and sedimentation; promoting at-risk species habitat conservation; energy conservation; and biological carbon storage and sequestration.

Maryland has identified the following additional priorities:

1. Livestock Management
2. Grazing Management
3. Erosion Control
4. Nutrient Management
5. Pest Management
6. Wildlife Habitat Enhancement

[<https://www.nrcs.usda.gov/wps/portal/nrcs/detail/md/programs/financial/eqip/?cid=nrcseprd416254>]

Agricultural Management Assistance Program (AMA)

AMA 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. Assistance is also available for constructing seasonal high tunnels and associated practices.

August 1, 2017



The Cover Crop Program in Carroll County saw another successful year with 32,065 acres enrolled. The NRCS EQIP, RCPP, and AMA Programs participated in 29 contracts, totaling \$1,717,187.42.³

Panora Acres in the Gunpowder Patapsco Watershed provides an example of how **EQIP** funds are used in **Carroll County**. The Sellers family had 300 head of dairy cattle eroding the streambanks and increasing nutrient concentrations in runoff. Through EQIP, the family installed stream crossings to allow safe passage and avoid erosion and nutrients in the stream. They fenced their cattle out of 2½ miles of the stream and planted buffers to stabilize the banks. [<https://www.nrcs.usda.gov/wps/portal/nrcs/main/md/newsroom/features/>]

Land Conservation through Parks

Carroll County Recreation & Parks

<http://ccgovernment.carr.org/ccq/recpark/>

410-386-2103

ccrec@ccq.carr.org

The significant contribution and role that parks play in the conservation of land and natural resources should not be overlooked. Carroll actively pursues and purchases land for parks and conservation of land and natural resources. These large land areas provide opportunities for eco-tourism, environmental education, water recharge, and passive recreation.

In addition to the conservation of biodiversity and resources, Carroll also has a long history of providing environmental education opportunities to residents. The County's first nature center, Piney Run, was opened in 1981, and a second nature center, Bear Branch, was opened in 1991. In addition, over 100,000 students have participated in Outdoor School since its inception in 1977 at a County park, a tradition that continues today for all local 6th grade students. Carroll continues to provide increased opportunities for citizens to experience nature first hand through outdoor recreation with over 40 miles of hiking and water trails.

For every 1,000 residents, the county provides 47 acres of County and municipal parks and recreation lands and 36 acres per 1,000 residents of natural resource lands. Carroll County parks, recreation and resource lands serve a growing population with diverse recreation needs.

Resource Management

Carroll County Bureau of Resource Management

<http://ccgovernment.carr.org/ccq/resgmt/>

410-386-2506

ccwater@ccq.carr.org

Natural Resources Easements

Acquired through Land Development

Water Resource Protection

Carroll County places high value on protecting our important water resources. The Water Resource Management Program largely focuses on the protection of streams, ponds, and wetlands through the implementation of buffers and easements. Water Resource Protection Easements provide a buffer to the stream system from adjacent land use and provide many benefits to the stream, watershed, or drainage area in which it resides. Benefits include filtering runoff, stabilization, nutrient uptake, moderating stream temperatures, and providing wildlife corridors.





There are two types of Water Resource Protection Easements – Forested and Non-Forested. Requirements for both types are almost identical except that non-forested easements require a dense and vigorous cover of non-lawn vegetation be maintained, while the forested easements are expected to be in forested condition. Each Deed of Easement defines permitted and restricted activities within the established easement. Restricted activities prohibited by the easements are soil disturbance; storing or dumping of materials; composting or broadcast spreading of yard waste; storing, maintaining, or operating motorized vehicles; housing or otherwise maintaining domestic animals; and burning of vegetation.

In 2017, Carroll County Bureau of Resource Management (BRM) began a water resource easement inspection program, similar to the inspection program for Floodplain and Forest Conservation. The inspections will be done on a three-year cycle or in response to citizen complaints.

Floodplain Protection

Carroll County recognizes the importance of protecting floodplains and the benefit this provides to both property owners and the environment. Floodplain is preserved through a Floodplain Protection Easement, which helps to protect human life and health, minimize property damage, encourage appropriate construction practices to minimize future damage, and to protect water supply, sanitary sewer disposal and natural drainage.

Floodplains are an important asset to the community, performing vital natural functions such as:

- ◆ Temporary storage of floodwaters
- ◆ Moderation of peak flood flows
- ◆ Maintenance of water quality
- ◆ Prevention of erosion
- ◆ Provision of habitat for diverse natural wildlife populations
- ◆ Improved aesthetics

Through the development process, property owners provide a Floodplain Protection Easement in perpetuity to preserve the natural vegetation and to prevent alteration of floodplains and the setbacks wherever floodplains are delineated. The floodplain setback is based on the floodplain width, stream buffer, or 100 feet from the top of the streambank on any mapped Federal Emergency Management Administration (FEMA) stream, whichever is largest.

In 2017, Carroll County began a floodplain easement inspection program, similar to the inspection programs for water resources and forest conservation easements. The inspections will be done on a three-year cycle or in response to citizen complaints.

***Carroll protected
91 miles of buffered
streams.***

Easement Type	Acres Preserved	# of Easements
Water Resource Protection	1,858	370
Floodplain Protection	621	196
Forest Conservation	4,009	1,440
Totals	6,488	2,006





Forest Conservation

Forest conservation easements are secured for the long-term protection for all retention, reforestation, afforestation, off-site reserve, and forest bank areas. The easement is conveyed to the County during the development process. Adequate fencing or other protective measures may be included to prevent encroachment into the area.

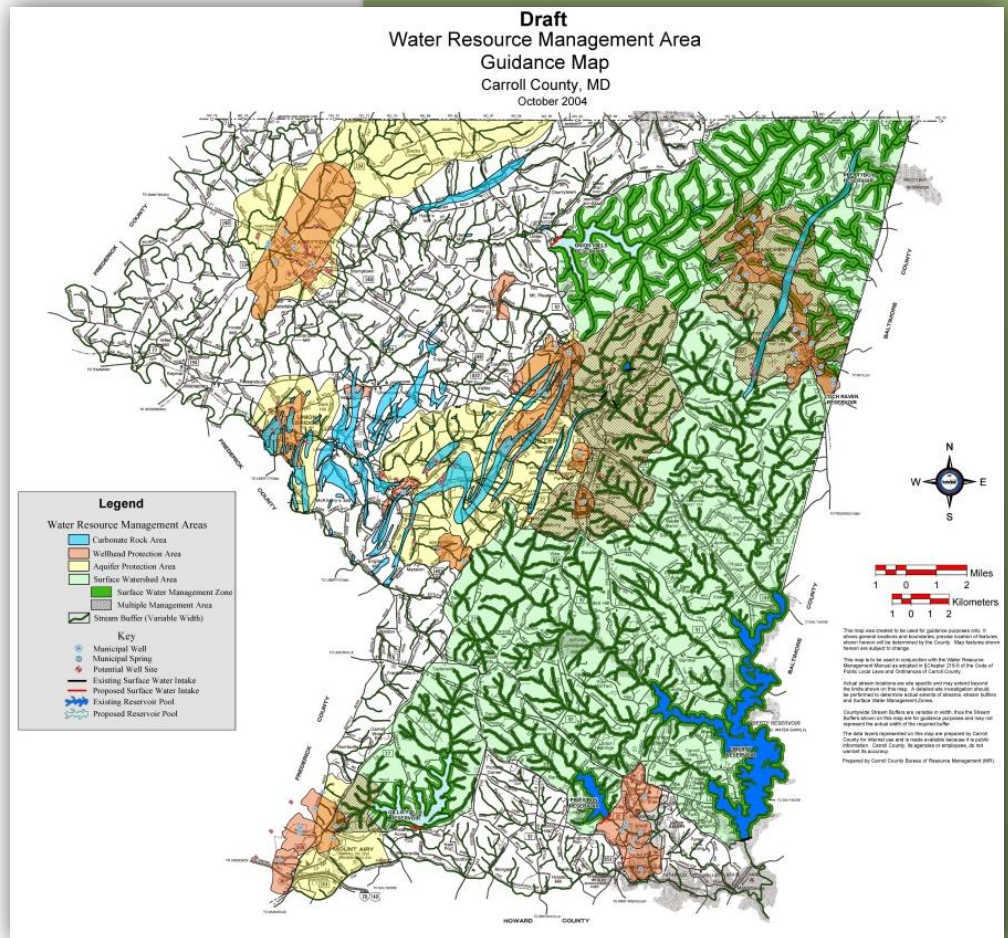


Carroll County Environmental Codes

Water Resource Management

The purpose of Chapter 154, Water Resource Management, is to protect the quality and quantity of ground and surface water resources in Carroll County. The Code, adopted in 2004, established management standards and design criteria for land use subsequent to review; standards for review of development activities; enforcement procedures for pollution violations; and requirements for the protection of existing and future water resources.

Water Resource Management also addresses wellhead protection areas, aquifer protection areas, surface watershed management areas, carbonate rock areas, streams, ponds and wetlands. Chapter 154 specifically addresses management standards and design criteria implemented for regulated substance use, sale, maintenance and storage within Water Resource Management areas; safeguards used to demonstrate that the integrity of water resources will not be altered by proposed activities; and protection of well and potential well sites with a 200-foot buffer requirement.



Floodplain Management

The County created the Floodplain Management Program, adopted a Floodplain Management Chapter (Chap. 153), and approved a Floodplain Management Specialist Position in 2004. The program received FEMA approval in 2006. On October 1, 2007, the County was accepted into FEMA’s Community Rating System program as a Class 8 community. This provides a 10 percent reduction on insurance premiums for holders of eligible flood policies within unincorporated areas of Carroll County.

August 1, 2017



The Carroll County Floodplain Management Program requires protection of floodplains by setting minimum technical standards for performing floodplain studies and producing consistent, accurate, current, and verifiable floodplain mapping. This mapping can be used to evaluate flood hazards, set flood insurance rate zones, and regulate new subdivision and building construction in and around floodplains. The floodplain mapping data long-term will enable prospective and existing property owners, lending institutions, and insurers to consider the risk prior to buying, building, financing, or insuring property, homes, or businesses subject to flood hazards.

The current Flood Insurance Rate Maps (FIRMs) issued by FEMA were adopted by Carroll County in October of 2015. These FIRMs replaced the maps produced by FEMA in 1981 and use more precise topography and more accurate hydrology. Nearly a decade’s worth of data capturing, surveying, analyzing, modeling, and public review went into the creation of these maps to more accurately map the flooding risk in Carroll County. During the summer of 2015, a comprehensive review of Chapters 153 and 38, as well as the Carroll County Floodplain Manual, was completed to ensure compliance with all State and Federal requirements.

Forest Conservation

The Carroll County Forest Conservation Code (Chap. 150) is intended to protect not only forests and trees in developing areas, but also any sensitive areas identified during the local planning or comprehensive land use plan adoption process. It requires that prior to the approval of any subdivision of land or development which results in the cumulative disturbance of 40,000 square feet or greater, applicants shall submit a Forest Stand Delineation (FSD) and a Forest Conservation Plan (FCP). These plans must be approved by Carroll County before development can proceed. The Carroll County Forest Conservation Technical Manual gives additional procedural information.³

“Carroll County’s Forest Conservation Code includes a **pioneering effort** that established the use of a *forest banking* program. Forest banking is a conservation tool that involves the establishment of new forest on areas that are then placed in easement, which generates mitigation credits that can be exchanged for a payment. The payment typically comes from a developer who must replace forest that has been cleared at another location. Although the code has evolved since its first iteration, the use of forest banking as a mitigation alternative has survived because of its effectiveness... In Carroll County, 558 acres of forest have been created by forest conservation banks since the inception of the Maryland Forest Conservation Act in 1991. Carroll County landowners are engaged in the establishment of viable and marketable forest conservation banks.”⁴

*For more information
on the Flood Insurance Rate
Maps, visit...*

http://ccgovernment.carr.org/ccg/MapServer4/GIS/webpage/FIRM_Coverpage.html

Carroll County Forest Conservation Acres Banked ⁵	
Element	Acres
Total bank acres	558
Other acreage	
On-site retention	3,351
On-site planting	1,475
Off-site retention	39
Off-site planting	314

Source: Carroll County Forest Conservation State Report, FY 1992 to FY 2016



Landscaping

Carroll County recognizes that landscape requirements for new development effectively add intrinsic value to the landscape in many ways, including the following:

- ◆ The preservation and enhancement of the aesthetic value of Carroll County's landscape;
- ◆ The augmentation of a sense of community in new development by visually tying properties together;
- ◆ The creation of a sense of place by using trees and other vegetation to define space and to buffer incompatible uses;
- ◆ The moderation of the impact of wind, temperature, rainfall, frost and other climatic elements;
- ◆ The effective conservation of energy use through that moderation; and
- ◆ The enhancement of property values by providing amenities to development design.

The County's landscape requirements (Chap. 157) enhance the aesthetic and environmental setting of new residential, commercial, industrial, and institutional development in Carroll County through the establishment and ongoing maintenance of prescribed landscaping.

Grading & Sediment Control

Establishing minimum standards (Chap. 152) for the control of soil loss through erosion to minimize sediment transport through runoff is critical to preventing degradation of the integrity and health of Carroll County's stream system. Minimum standards for management practices are applied through the issuance of grading permits for land disturbance that may involve clearing, grubbing, grading, filling and the movement of soil to alter the topography and for forest harvest activities.

Stormwater Management

The goal of stormwater management is to manage stormwater by using environmental site design (ESD) to the maximum extent practicable (MEP) to maintain after development, as nearly as possible, the predevelopment runoff characteristics, thus reducing stream channel erosion, pollution, siltation, sedimentation, and local flooding, and to use appropriate structural best management practices (BMPs) only when necessary. This will help restore, enhance, and maintain the chemical, physical, and biological integrity of streams, minimize damage to public and private property, to reduce the impacts of land development.

Capital funding of \$335,000 per year is budgeted for stormwater facility renovations, for a total of \$2,010,000 for FY 2018 to FY 2023. The program funding, which began July 1, 2015, is designed to support long-term improvements to existing stormwater management facilities which are beyond routine maintenance but are not undertaken as part of the County's retrofit program. The program evaluates and repairs 5 to 10 facilities per year over a 30-year period. The funding is used for pipe replacement, erosion

August 1, 2017



Environmental Site Design

(non-structural practices)



**Residential:
Extended Shoulder**



**Residential:
Drywell
With Debris Filter**



**Commercial:
Parking Island
Filtration/
Infiltration**



**Urban Stormwater
Retrofit**

repairs, filter media replacement, and other items which will extend the useful life of a facility and to maintain compliance.

Urban Stormwater Mitigation

Carroll County since 2008 has been actively working on retrofitting existing stormwater management facilities to address our Phase I National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit requirements. Not only are we moving forward in reaching our impervious restoration goals, the County is accomplishing restoration of its old stormwater management facilities by bringing them up to current standards and redesigning these facilities to allow for easier access and maintenance. The majority of the facilities are designed to treat one inch of water quality, while providing infiltration and channel protection. The main goal is to reduce the amount of water leaving the facility to decrease the downstream property impacts and improve runoff water quality.

Stormwater mitigation and watershed restoration provide a significant water quality and quantity benefit to our local streams and water bodies, including nutrient reduction, sediment and erosion control, and flood control. These activities and practices also contribute to improving the health of the Chesapeake Bay.

Collaboration with Municipalities

In FY 2013 and FY 2014, via the Water Resource Coordination Council (WRCC), the County and municipalities collaborated to develop, sign, and implement a Memorandum of Agreement (MOA) to cost-share the capital costs of meeting the municipalities' stormwater mitigation requirements (80% County/20% municipalities), for the County to provide administrative and operating support services for the stormwater mitigation program, and for the WRCC to act as the forum for setting project priorities. The MOA was signed on October 23, 2014. This cooperative and progressive co-permittee arrangement and associated MOA are unique to Carroll County in Maryland. The program has been very successful at providing a cost-effective and collaborative approach to meeting permit restoration requirements.

Staff

Approximately **23 (about 51%) employees out of 42** in the Department of Land & Resource Management are involved in watershed restoration initiatives – 3 on a full-time basis, 10 on a part-time basis greater than 50 percent or more of their time, and 10 on a part-time basis of less than 50 percent. Additional employees are involved with maintenance in the Department of Public Works.

Expenditures & Budget

Carroll County's annual operating expenditures for this program have more than doubled since 2008, from approximately \$334,000 annually, to more than \$1.1 million annually. **From July 2005 to June 30, 2017, the County invested almost \$15 million – not August 1, 2017**



Facility at
Westminster
High School

**Beneficial
Capture,
Treatment,
& Release of
Stormwater
Runoff**



***Under the MOA, the
Carroll County
Commissioners pay 80%
of the municipalities'
capital costs to meet
their restoration
requirement.***



including more than \$5.2 million in grants from outside sources – in Capital outlays. Additionally, \$23.1 million have been dedicated to watershed restoration efforts in our Community Investment Program, or CIP, for Fiscal Years 2018 through 2023.

For the 16-year period (2008-2023), Carroll County will invest almost \$14.9 million in operating expenses and more than \$49.6 million in capital expenditures for a **grand total of over \$60.3 million** – assuming that we receive no additional grants. This equates to an annual expenditure of approximately \$3.8 million over that time period. Average annual expenditure will be almost \$5.3 million for FY 2018-2023.

Since 2009, the Bureau of Resource Management has been very successful in acquiring grants for our restoration efforts. The Chesapeake Bay Trust (CBT), Maryland Department of Natural Resources (DNR), Maryland Department of the Environment (MDE), National Fish and Wildlife Foundation (NFWF), and Maryland State Highway Administration (SHA) has supported BRM by providing funds in excess of \$12 million. These funds have gone towards projects such as stormwater management pond retrofits, installation of new BMPs, tree plantings, and various monitoring studies being performed in Carroll County. For additional information on the grant program, please visit the BRM website at <http://ccgovernment.carr.org/ccg/resmgmt/>.

Progress

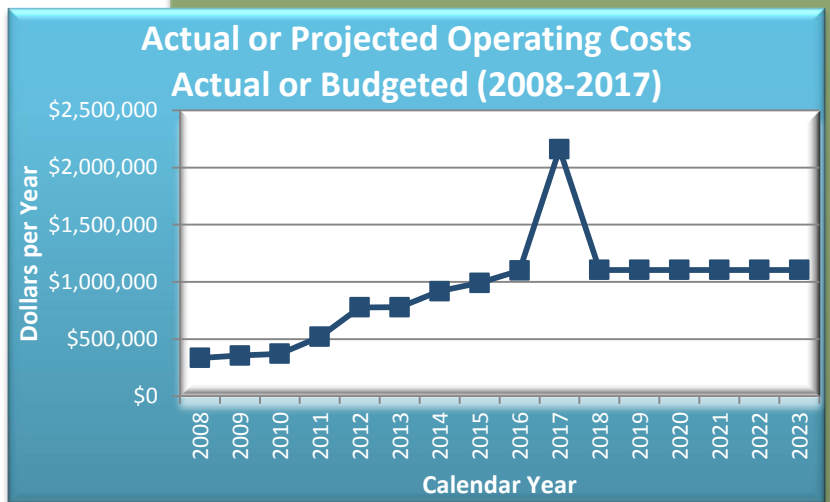
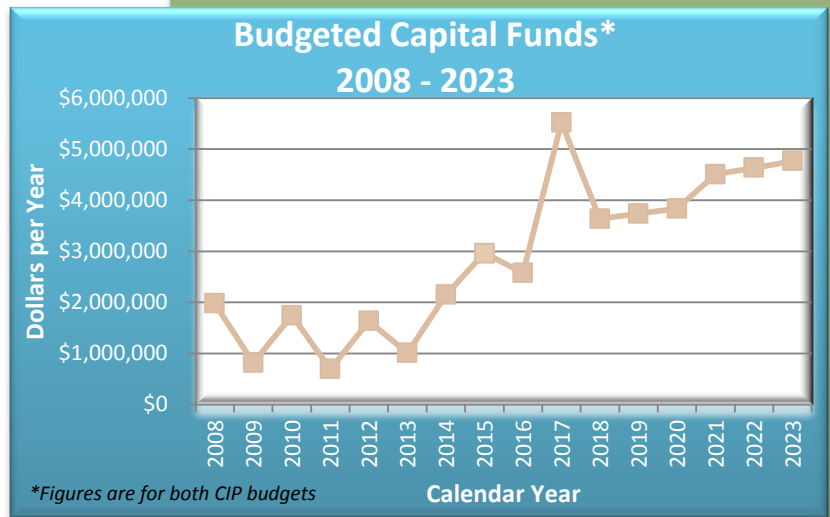
As of June 2017, the County had restored 2,057 impervious acres. This included 688 acres of restoration to comply with the 10 percent required under the prior permit, which did not include the municipal impervious area. During this permitting term, 1,369 acres of impervious area have been restored, which is 85 percent of the required goal of 1,614 acres – on track to meet the 20 percent restoration requirement.

Watershed Assessments and Restoration Plans

Stream corridor assessments were completed for each of the 9 watersheds within Carroll County. Through these assessments, the general condition of a stream system was quickly assessed and measures identified to improve the overall health of the drainage network. Eight types of impairments were assessed, including stream bank erosion, inadequate streamside buffers, trash dumps, pipe outfalls, exposed pipes, channel alteration, in-stream construction, and fish blockages.

County staff works closely with property owners to access streams on their properties in these watersheds, with almost 54 percent granting permission to perform the stream walk. As a result, staff

FY 2018-2023	Capital	Operating
Total Budget	\$23,101,000	\$14,890,702
Average Annual Budget	\$3,850,167	\$1,103,543



Impervious Area	Acres	Percent
Untreated County	8,070	2.8% of County area
Restoration Requirement	1,614	20% of Total Urban Impervious
Progress to Date for This Permit Term	1,369	85%

accomplished **assessments on roughly 786 of the 1,464 miles (54%) of stream corridor** within these watersheds. Each of the 9 watersheds was assessed over a 6-year period.

In addition to the on-the-ground field assessments, County staff conducted an analysis using Geographic Information Systems (GIS) of each of the 9 watersheds. A characterization plan was developed for each watershed describing its unique background, character, and data collected.

Information provided by the characterization plans and stream corridor assessments were used as a tool to develop watershed restoration plans. The restoration plans are used to identify opportunities for water quality improvements within the watershed, as required by the County's NPDES MS4 permit, and are designed to meet approved total maximum daily loads (TMDLs) for affected watersheds. Each restoration plan focuses on identified impacts discovered during the assessment process and prioritizes projects based on water quality data.

Due to the cooperation of private landowners, as of June 2016, staff performed **assessments in all of the 9 major watershed basins** within the county, walking **over 518 of the 820 stream miles within these 9 watersheds**.

Stream Buffer Initiative (Tree Planting)

Stream Buffer Initiative

The stream buffer initiative was developed from Carroll County's stream corridor assessments as a means to help landowners obtain trees to address inadequate streamside buffers. Stream buffers are vegetated areas along streams that reduce erosion, sedimentation and pollution of water. This initiative is completely voluntary to landowners with a goal of re-establishing forested corridors along as many streams as possible.

Reestablishing and enhancing streamside buffers helps streambank stabilization, protects and enhances water quality through nutrient uptake, trapping sediment, and removing pollution. The additional trees in the buffer make for a great home to a great diversity of species, providing structurally complex habitats, and can serve as travel corridors. The trees, when fully established, will also provide shading to waterways that helps regulate water temperatures.

Letters were mailed to landowners whose properties were identified as having inadequate buffers, which provided education on the importance of stream buffers and offered grant-assisted buffer plantings at no cost to the landowner. Interested property owners were able to choose the stream-side areas they wanted to be planted, how much of that area to plant and select from a list of native deciduous trees and shrubs they would like to be planted. A mixture of overstory and understory tree and shrubs selected were based on environmental conditions such as ground saturation and existing trees on site that suggested optimal survivability.

August 1, 2017



So far, 122.7 acres of trees have been planted in Carroll County since spring 2013 on both private landowner properties as well as municipality owned land. Plantings by watershed include:

- ◆ 51.27 acres in Double Pipe Creek
- ◆ 13.56 acres in Liberty
- ◆ 12.22 acres in Lower Monocacy
- ◆ 4.74 acres in Prettyboy
- ◆ 12.71 acres in South Branch
- ◆ 28.20 acres in Upper Monocacy



Plantings implemented through the Bureau's stream buffer initiative include a 3-year maintenance term, which consists of mowing, stake repair, and shelter maintenance. Successful plantings require the survival of 100 trees per acre. Each planting will be inspected bi-annually for 10 years to ensure the success of the program, and once every 3 years after the 10-year period.

Through this initiative we are looking to plant as much acreage as possible, however the minimum size area accepted is 0.1 ac or 20-30 trees per interested property owner. Ideal planting locations include areas contiguous to existing forest and areas along the stream on your property. Trees will be planted in rows using 15-foot spacing. This spacing allows for easy access for mowers and maintenance. We include a maintenance package for 3 years where a contractor will mow around the trees three times a year and reset tree shelters four times a year. Planting areas and trees planted are determined based on landowner requests using our preferred tree selection list and expert guidance.

Staff works with the property owner to select from a variety of native trees. The landowner agreement lays out permissions for access and the 10-year inspection cycle. Staff schedules a site visit with property owners at their properties to evaluate planting areas and discuss tree choices.

We cannot plant trees in areas with existing right-of-ways or easements. Examples include utility, road, or use-in-common rights-of-way and existing conservation, agriculture, or drainage easements. Additional limitations are areas that block sight distance, or access to a property or use in common drive, or areas of active agriculture. The agricultural community is encouraged to contact the Carroll Soil Conservation District for interest in assistance with streamside buffers.

A landowner must be willing to allow Carroll County staff to inspect the planting progress twice a year for up to 10 years, or the length of the landowner's ownership of the property. The landowner must be willing to cause no intended harm to the planting. This program has been very successful, and BRM will continue to work with property owners on this initiative.

Public Outreach

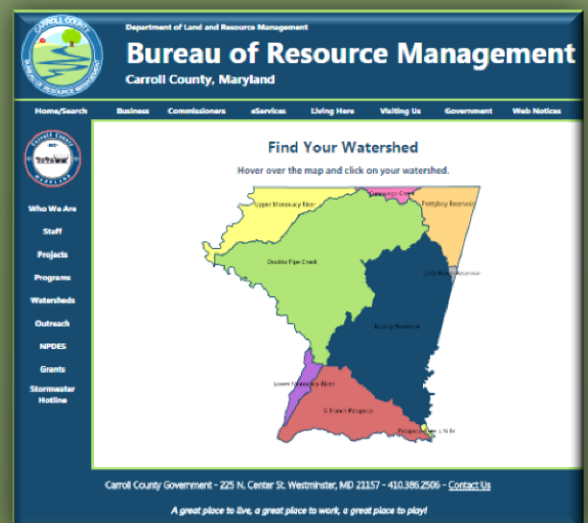
In Carroll County, staff is continuously involved in environmental education efforts. LRM staff regularly volunteer to speak at schools, community organizations, club meetings, and other venues in an effort to ensure that effective and timely environmental information is available to the community.

The County and municipalities provide materials on stormwater pollution prevention and other environmental issues and opportunities at their offices and at various events held throughout the year. In addition, storm drain stenciling is implemented

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Citizens throughout the county can call the non-emergency Stormwater Pollution Prevention Hotline to report suspected illicit discharges, illegal dumping, and spills.

410-386-2210





water. The program aims to assist Partners with voluntary activities related to stormwater pollution prevention. Static cling window decals are provided to Partners. The website provides informational materials, the self-inspection checklist, event information, a list of Partners, and other relevant information. (<http://ccgovernment.carr.org/ccg/npdes/ccwp/>)

Public Workshops

Workshop: Homeowners & Stormwater. The EAC partnered with the WRCC to host a free workshop designed to share information with homeowners about how to prevent stormwater pollution and minimize stormwater runoff from their properties. The first workshop was held in March 2017 and will be offered every other year. (<http://ccgovernment.carr.org/ccg/npdes/workshop/>)

Workshop: Carroll County Businesses for Clean Water. The EAC partnered with the WRCC to develop a free workshop designed to help businesses understand stormwater regulations that affect them and good housekeeping practices they can employ. The first workshop was held in January 2016 and will be offered every other year. (<http://ccgovernment.carr.org/ccg/npdes/workshop/>)

Schools

Staff partners with the Carroll County Public Schools' elementary science programs each year to educate and engage fourth and fifth grade students on issues related to water quality that coincide with the curriculum. Sessions are provided on topics such as biological/stream health, stormwater, and the importance and benefits of tree planting. In addition, Outdoor School students participate in tree planting events.



Septics

Conventional Septic System Replacement with Best Available Technology (BAT)

Maryland Department of the Environment adopted regulations requiring all new septic systems installed to use Best Available Technology (BAT) to reduce the potential new nitrogen loads resulting from new development. The Carroll County Health Department works with private property owners to replace failing conventional systems with BAT systems. The Health Department administers monies from the Bay Restoration Fund to help pay for eligible systems.

Conversion from Private Septic to Public Sewer System Connection

Carroll County works closely with its eight municipalities on public water and sewer planning. In the process of identifying potential future public sewer service areas, areas on existing private septic systems are often considered for inclusion in the Future Sewer Service Area, particularly if systems are documented to be failing. Conversion from private septic to public sewer for these homes helps to reduce the amount of pollution to the Bay. The Health Department administers assistance from the Bay Restoration Fund to help pay for the conversion to a public system.

Solar Energy

Zoning:

Zoning Administration 410-386-2980
<http://ccgovernent.carr.org/ccg/zoningad/> cczoning@ccg.carr.org

Permitting:

Bureau of Permits & Inspections 410-386-2674
<http://ccgovernent.carr.org/ccg/permits/Solar.aspx> jqgreen@ccg.carr.org

County Solar Projects:

Department of Public Works 410-386-2035
<http://ccgovernent.carr.org/ccg/pubworks/> smoser@ccg.carr.org

Zoning

With the increasing popularity of solar energy as an alternative to traditional energy sources for homes and as a commercial venture, the County Commissioners amended Chapter 158 Zoning of the County Code of Public Local Laws and Ordinances in 2014 to incorporate provisions allowing solar energy conversion facilities. Initial recommendations for code requirements were prepared by the Environmental Advisory Council (EAC). The code addressed both accessory uses in residential, commercial, and industrial zones, as well as requirements for commercial operations.

In 2016, at the Board's request, the EAC recommended revisions to the residential solar surface area requirements of the zoning code.

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Action	# of Septics
Conventional System Replaced with BAT ⁶ : 2009-2016	105*
Conversion from Conventional System to Public Sewer Service: 2006-2016	22*

* As of December 2016

Lot Size	Solar Panel Surface Area Maximum Square Footage for Ground-Mounted Systems
<= ½ acre	120 square feet
>½ acre	240 square feet
>1 acre to 3 acres	480 square feet
>3 acres	Aggregate square footage of the roof, or roofs of structures, situated on the subject property



The Board adopted the amendment in October 2016, increasing the allowable surface area on residential properties. To review the zoning requirements related to solar facilities, see <http://ccgovernment.carr.org/ccg/attorney/code/> and choose Chapter 158.

Permitting

The Carroll County Bureau of Permits & Inspections provides permitting and inspections to ensure that solar panels are safe for use. These include electrical, building, and possibly plumbing permits. The staff works with applicants to facilitate a quick review process, usually within 10-15 business days if the application is complete, accurate, and code-compliant. A checklist of required information, as well as fee schedules and contact information, are available on the Bureau’s webpage at <http://ccgovernment.carr.org/ccg/permits/Solar.aspx>.

County Solar Projects

Carroll County Government has actively worked to reduce energy usage at its facilities. Equipment is regularly replaced with energy efficient models and parts as opportunities arise. The County has a contract with Johnson Controls to regularly evaluate energy usage and make recommendations for energy and cost-saving measures. The contract guarantees a certain level of savings for the County through implementation of the recommendations. The County has also pursued grants to fund the cost of replacement of lights with more energy efficient lighting.

A significant source of energy savings will be realized through the installation of solar arrays on three different County properties – Carroll Community College, Hoods Mill Landfill, Hampstead Wastewater Treatment Plant, and a fourth undetermined site (as of July 2017). Completion of installation at these three facilities is expected before the end of 2017. Department of Public Works staff anticipates up to 25 percent reduction in the County’s energy bill for County facilities through these projects. A low fixed-rate of \$.077 per kilowatt hour is guaranteed by the contract through 2037 for the 13.4 megawatt hours to be supplied by the solar panels.

Public Outreach

The EAC created a public outreach booklet to help provide Carroll’s residents with basic information to navigate the process in Carroll County of installing accessory solar facilities in residential districts. The booklet, which is available on the EAC’s webpage provides information regarding the process, certified installers, frequently asked questions, questions to ask the solar company/installer, financing, and more. The booklet can be viewed or downloaded on the EAC webpage at <http://ccgovernment.carr.org/ccg/eac/>.

Permits Issued in Carroll County for Solar Energy Conversion Facilities FY 2015, 2016, & 2017	
Fiscal Year	# of Permits
2015	409
2016	588
2017	506



Carroll Community College

Solid Waste & Recycling

Carroll County Bureau of Solid Waste
recyclecarroll.org

410-386-2035
SolidWasteRecycling@ccq.carr.org



Carroll County actively seeks to divert waste from the landfill. Recycling participation is on the rise in Carroll County. Options for both curbside and drop off opportunities have increased, as has the type of materials that can be recycled.

Curbside, single-stream recycling was implemented in 2007 (and expanded in 2008), making it easy and convenient for residents to participate. Most standard household recycling can simply be placed at the curb.

Carroll's newly renamed Resource Recovery Facility is conveniently located in the center of the county and accepts many items that are not eligible for curbside pickup, such as Styrofoam, electronics, automobile batteries, antifreeze/waste oil, cooking oil, and textiles. Carroll County has taken advantage of grant opportunities to purchase and distribute large recycling containers that added to the ease of handling curbside recycling.

Carroll County also encourages property owners to divert yard waste from the landfill. Citizens can dispose of grass, leaves, and branches in the mulching area of the Resource Recovery Facility. These items are mulched at the landfill. Citizens are encouraged to consider backyard composting. The County provides an opportunity to purchase compost bins and rain barrels at a discounted rate in the spring.

The Recycling program offers a semi-annual household hazardous waste collection to ensure household chemicals are not improperly discarded. The Recycling office diligently works to inform citizens and instill the "Reduce, Reuse, Recycle!" theme.

Through all recycling efforts, **the County has achieved a 49 percent recycling and waste diversion rate that includes a 5 percent source reduction credit in 2015** (based on Maryland Department of the Environment Recycling Report). The State-mandated recycling rate is 35 percent.

To proactively address changing and future solid waste needs, a Solid Waste Work Group evaluated options and prepared a report with recommendations. A Solid Waste Advisory Council (SWAC) was established in 2014 to help implement recommendations of the various solid waste plans and advise staff. The SWAC meets regularly.

Accepted through Single-Stream, Curbside Recycling

- ◆ Glass jars & bottles
- ◆ Aluminum, tin and steel cans, containers, and foil
- ◆ Cereal boxes and other paperboard boxes
- ◆ Cardboard
- ◆ Aseptic/gable-top milk and juice cartons
- ◆ Books (paperback)
- ◆ Plastics bags and film (bagged together)
- ◆ Plastic bottles
- ◆ Magazines and catalogs
- ◆ Newspaper, office paper, and junk mail
- ◆ Plastics containers #1-#7 (except #6)
- ◆ Paper bags
- ◆ Cardstock, color paper
- ◆ Shredded paper (in sealed clear bags)
- ◆ Aerosol cans (empty)
- ◆ Rigid plastics

Accepted at Resource Recovery Facility (either on a regular basis or part of special event)

- ◆ Styrofoam
- ◆ Residential Electronics
- ◆ Household Hazardous Waste
- ◆ Textiles
- ◆ Backyard Trimmings
- ◆ Vinyl Siding
- ◆ Car batteries, antifreeze, and waste oil

Water Resources Coordination Council (WRCC)

Carroll County Land & Resource Management
<http://ccqgovernment.carr.org/ccq/plan/wrcc/>

410-386-2949
LRM@ccq.carr.org



The Water Resource Coordination Council (WRCC) was formed in March 2007 by a non-binding joint resolution (#697-07) between the County, municipalities, and Carroll County Health Department. The Council provides a mechanism for cooperative problem solving of critical water resource management issues facing the County and municipalities. The Council fosters discussion between jurisdictions in order to develop regional (watershed) or countywide approaches to policies, procedures, and solutions regarding water resource development and protection. The WRCC offers a forum for the dissemination of ideas, solutions, and cost-saving approaches to water resource development and protection in Carroll County.

Among other things, the WRCC worked collaboratively to develop a Water Resources Element (WRE). The WRE identifies drinking water and other water resources needed for existing and future growth. It also identifies suitable receiving waters (where stormwater and treated wastewater can be discharged) and land areas for stormwater management and wastewater treatment. In Carroll County, the WRE addressed the County and all eight municipalities in one document and was jointly adopted. The WRCC also serves at the local Watershed Implementation Plan team, addressing issues related to the local implementation of the Chesapeake Bay Total Maximum Daily Loads (TMDLs).

The members have worked together to address cost-sharing of stormwater projects and provide shared staff to address NPDES MS4 compliance work. On October 23, 2014, the Board of County Commissioners and the Mayors of all eight municipalities signed a Memorandum of Agreement (MOA). With the MOA, the Board committed to funding 80 percent of the municipalities' capital costs for stormwater mitigation projects. In December 2014, MDE issued the County's fourth generation NPDES Phase I MS4 permit, in which the municipalities were named as co-permittees. The MOA outlines the distribution of permit responsibilities.

Environmental Advisory Council

Carroll County Land & Resource Management
<http://ccqgovernment.carr.org/ccq/eac/>

410-386-2140
EAC@ccq.carr.org



Originally formed as the Environmental Affairs Advisory Board in the early 90s, the Board of County Commissioners created the Environmental Advisory Council (EAC) through County Code (Chap. 31) in 2004. The EAC is dedicated to exploration and promotion of the County's environmental management responsibilities, to providing the Commissioners with educated advice that is in the best interest of the County and the County's residents, and to promote environmental educational. The 9-member EAC functions at the direction of the Carroll County Board of Commissioners and, as such, works cooperatively with County environmental staff to research environmental policy issues; to advise the Board of County Commissioners; to foster environmental education; and generally to act in the best interest of County residents by promoting effective environmental protection and management principles. Every other year, the EAC accepts nominations for Environmental Awareness Awards. Winners are recognized in a joint ceremony with the Board of County Commissioners, in the press, and on the EAC's website.



References

- ¹ Maryland Department of Agriculture. Maryland Agricultural Water Quality Cost-Share Program. 2013. *Opening Doors for Maryland's Conservation Farmers: 2016 Annual Report*. http://mda.maryland.gov/resource_conservation/counties/MACS_FINAL.pdf
- ² Carroll Soil Conservation District. Conservation News and 2016 Annual Report. 2016.
- ³ Carroll County, Maryland, Forest Conservation Technical Manual. May 2011. <http://ccqgovernment.carr.org/ccq/resmgmt/forconsmanual.pdf>
- ⁴ Slater, James E. Jr., and Glenn D. Edwards. 2010. "Chapter 4 Incentive Driven Conservation," *A Sustainable Chesapeake: Better Models for Conservation*, The Conservation Fund. <http://www.conservationfund.org/a-sustainable-chesapeake-better-models-for-conservation/>
- ⁵ Carroll County Health Department. 2016.