



# watershed resources registry





## History

- A pilot Registry grew out of the **Green Highways Partnership** and the Maryland State Highway Administration (MDSHA) proposal for making the Route 301 Project the **1st Green Highway**.





## WRR: Three meanings

- **WRR: a collaborative, ongoing partnership with EPA Region 3, several MD agencies, the Corps (Baltimore District and HQ) and several others**
- **WRR: a set of eight suitability analyses**
- **WRR: an interactive website that provides all users, including the general public, access to the findings**



## Why is the WRR unique?

*Unlike many mapping and targeting tools...*

There is agency collaboration and program integration between:

- **CWA 319, 401,402,404, 303(d)**
  - Watershed planning, permit review, mitigation assessments
  - TMDL and WIP applications
  - Stormwater management
- **Resource conservation/ environmental resource planning**
- **Green Print and Rural Legacy priorities**
- **Section 7 (Threatened and Endangered Species)**
- **Transportation and land use planning**
- **NEPA review**

... and more!



## Collaboration

Current partner agencies:

- U.S. Environmental Protection Agency (EPA), Region III
- U.S. Army Corps of Engineers , Baltimore District
- Maryland Department of the Environment (MDE)
- State Highway Administration
- U.S. Fish and Wildlife Services
- Maryland Environmental Services
- Maryland Department of Natural Resources
- U.S. Federal Highway Administration

A Technical Action Committee (TAC), consisting of individuals from these partner agencies, collaboratively strategizes the development, progress, and future of the WRR, and uses it as a vehicle to discuss how to reduce cost and maximize environmental benefit.





## The Initial Process

- The Technical Action Committee (TAC) was a product of the October 2009 Managers Meeting
- Circulated stakeholder questionnaire to explicitly:
  - Identify **unique needs** of each agency
  - Identify what questions need to be answered
  - Identify what **data is required** to answer these questions



## WRR Technical Development Process

- TAC and questionnaire helped assemble a wide variety of information and geospatial data sets, and identify data gaps
  - Highlighted commonly available datasets vs. those available only in MD
  - Nationally available datasets (facilitate transferability)
  - Locally available & advanced datasets
  - Green Infrastructure
- Agreed upon factors for each Suitability Analysis (SA)



## The Suitability Analyses (SA)

- Upland Preservation
- Upland Restoration
- Wetland Preservation
- Wetland Restoration
- Riparian Zone Preservation
- Riparian Zone Restoration
- Preserve Healthy Stormwater Systems
- Restore Degraded Stormwater Systems





# Goals of the Eight Suitability Analyses

- To find and score areas that might present “eco-opportunities”
- Eco-opportunity is a place where some specific action beneficial to the resource, watershed, or environment might be undertaken



## Example of Use of the Suitability Analyses

- mitigation sites
- create riparian buffer zones
- restore wetlands
- avoidance and minimization
- stormwater
  - preservation of natural areas
  - fix older systems



## Factors for Wetland Restoration

Relative Factors

- in a Blue Infrastructure priority watershed
- in a Biological Restoration Initiative (BRI) watershed
- in Chesapeake Bay Commission Critical Area (LDA or RCA only)
- near (200') or in a Green Infrastructure hub or corridor
- in a Green Infrastructure "gap" area
- in a 100-year (1 point) or 500-year (½ point) flood plain
- in an impaired watershed (as indicated by §303-d)
- in or near (200 feet) of a GreenPrint Targeted Ecologic Area
- near (200') but not in a protected land
- near (within 200') but not in a Sensitive Species Project Review Area (SSPRA)
- near (200') but not in a stream or wetland
- within 200' (1 point) or within 600' (½ point) of a stream designated for uses II, II or IV
- in a Stronghold Watershed area 1 (1 point) or 2 (½ point)
- in a Tier II "watershed"
- in a Trust Fund Watershed - High Priority (1 point) or Medium Priority (½ point)
- is near (200') but not in a Wetland of Special State Concern

Absolute Factors

- cannot be a wetland
- cannot be forested and
- must be on a very poorly drained soils, somewhat poorly drained soils or poorly drained soil



- Home
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- Suitability Analyses
- GIS Layers
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## Welcome

Welcome to the Watershed Resources Registry, an interactive mapping tool to characterize and prioritize natural resource management opportunities using a Watershed Approach. Areas across Maryland have been scored on a scale of one to five stars based on their potential benefits for restoration or preservation. Users can either access the interactive mapping tool or download the data directly.

### Using the Watershed Resources Registry allows you to:

- Identify candidate locations
- Assess and compare potential projects
- Export data and print site maps for field visits

After exploring the site or utilizing the mapping tool for watershed information, we welcome your [feedback](#).

### Technical Requirements

To use this website we recommend using a high speed internet connection using Internet Explorer 7.0 or 8.0. Additionally, Adobe PDF Reader 9.0 and Adobe Flash Player 10.0 are required. The resolution of your monitor is also important; make sure your resolution is 1024 x 768 or above.



**Watershed Resources Application**

**Model Descriptions**

**Factsheet**

### Supplementary Documents:

- [2 page Fact Sheet](#)
- [Post Cards](#)
- [2x2 Cards](#)
- [Flyer](#)
- [Model Descriptions](#)



## Watershed Resources Registry: Web Application

**Watershed Resources Registry**

EPA | USACE | EWS | FHWA | SHA | MDE | DNR | Help

Location Details Results

To begin, please follow the steps below:

- Use the 'Address Locator' tool or 'Zoom/Pan' tools above to find your location.
- Select the 'Find Opportunities' tool to locate resources within the study area.
- Select the 'Location Details' tool above and then click the location of interest on the map.

Opportunities Results

Address Results

Map Contents

0 3 6 12 18 24 Miles

Open WRR Tools





## Search by County or Watershed

The screenshot shows a search menu with the following options:

- Find Opportunities
- Location Details
- X/Y Location
- Zoom to County
- Zoom to Watershed
- Address Locator
- Print Map/Results

On the right side of the menu, there is a vertical bar with the text "Close WRR Tools" and a downward arrow.



## Toolbar Buttons

Zoom In

Pan

Back Extent

Magnifier

Measure



Zoom Out

Full Extent

Forward Extent

Map Identify

Show Overview Map



## Overlaying Multiple Layers

The screenshot shows the Watershed Resources Registry interface. On the left, the 'Map Contents' panel lists various layers with checkboxes:

- Physiographic Region
- Geology
- Wetland
  - Wetlands of Special State
  - NWI
  - DNR
- Soils - Appears If Zoomed In
- Green Infrastructure
  - Corridor
  - Gap
  - Hub
- Blue Infrastructure
- Species Related Data
  - Sensitive Species Project
  - Targeted Eco Area
  - Forest Interior Dwelling S
- Sea Level Rise
- Base Data
  - Chesapeake Bay Critical
  - Protected Lands
  - Priority Funding Area
  - Land Use/Land Cover 200
  - Land Use/Land Cover 200
  - iMAP
  - ImageryBaseMapsEarthC
  - ESRI World Imagery
  - US Topo maps

The map displays several watersheds, including:
 

- Wappoquin Creek-Nanticoke River
- Ellis Bay-Wicomico River
- Broad Creek-Manokin River
- Deal Island-Tangier Sound
- Monie Bay
- Taylor Branch-Manokin River
- Kings Creek
- Back Creek
- Big Annemessex River

On the right, a toolbar contains the following options:
 

- Find Opportunities
- Location Details
- XY Location
- Zoom to County
- Zoom to Watershed
- Address Locator
- Print Map/Results

At the bottom of the map, a scale bar indicates distances in feet, with markers at 0, 13232646, 5292, 7938, and 10584.



## Selecting "Location Details"

The screenshot displays the Watershed Resources Registry interface. On the left, a sidebar contains navigation and information sections:

- Location Details Results**
- Watershed Resources Improvement Opportunities**
  - Upland Preservation: 3
  - Upland Restoration: 3
  - Wetland Preservation: Not Suitable
  - Wetland Restoration: 3
  - Riparian Preservation: 2
  - Riparian Restoration: 2
  - Stormwater Natural Infrastructure Preservation: 1
  - Stormwater Compromised Infrastructure Restoration: 4
- Watershed Characteristics**
  - [View Watershed Profile](#)
  - HUC: 020700090401
  - HUC Name: Upper Little Pipe Creek
  - Maryland 8 Digit Watershed: 02140304
  - Maryland 12 Digit Watershed: 021403040272
- Metadata:** [HUC](#) | [MD Watershed](#) | [Stronghold](#)
- Waterways**
  - Nearest Stream: Unnamed Tributary to Roop Branch
  - Stream Use Designation: IV-P
  - Distance: 8 ft.
- Metadata:** [Stream Use Designations](#)
- Water Quality Impairments**
  - [Metadata](#)
  - Impairments: Biological, Nutrients, Sediments
- Physiographic Region**
  - [Metadata](#)
  - Province: Piedmont Plateau Province
- Geology**
  - [Metadata](#)
  - Name: Silver Run Limestone
- Wetlands**
- Opportunities Results**
- Address Results**
- Map Contents**

The main map area shows a watershed with various creeks and rivers. A popup window titled "Location Details" is open over a specific location, displaying:

- Latitude/Longitude: 39.581, -77.1088
- Watershed Resources Improvement Opportunities**
  - Upland Preservation: 3
  - Upland Restoration: 3
  - Wetland Preservation: Not Suitable
  - Wetland Restoration: 3
  - Riparian Preservation: 2
  - Riparian Restoration: 2
  - Stormwater Natural Infrastructure Preservation: 1
  - Stormwater Compromised Infrastructure Restoration: 4

On the right side of the map, a green sidebar menu is visible with the following options:

- Find Opportunities
- Location Details (selected)
- X/Y Location
- Zoom to County
- Zoom to Watershed
- Address Locator
- Print Map/Results



## Using The “Find Opportunities” Query

**Location Details Results**

To begin, please follow the steps below:

- Use the 'Address Locator' tool or 'Zoom/Pan' tools above to find your location.
- Select the 'Find Opportunities' tool to locate resources within the study area.
- Select the 'Location Details' tool above and then click the location of interest on the map.

**Find Opportunities**

Location Details

X/Y Location

Zoom to County

Zoom to Watershed

Address Locator

Print Map/Results

**Find Opportunities**

Select a County: Allegany

Select a Watershed: All Watersheds

Select Potential Opportunities:

<input checked="" type="radio"/> Upland Preservation	<input type="radio"/> Upland Restoration
<input type="radio"/> Wetland Preservation	<input type="radio"/> Wetland Restoration
<input type="radio"/> Riparian Preservation	<input type="radio"/> Riparian Restoration
<input type="radio"/> Stormwater Natural Infrastructure Preservation	<input type="radio"/> Stormwater Compromised Infrastructure Restoration

Select Score:

Select Score Operator: =

Where Acres is Greater Than (>): Any Area

Where Acres is Less Than (<): Any Area

Find Opportunities

**Opportunities Results**

**Address Results**

**Map Contents**



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## Overlaying Layers On Aerial View Map

The screenshot displays the Watershed Resources Registry interface. The main map area shows an aerial view with several colored overlays: blue for water bodies, orange for wetlands, and various shades of green and brown for other resource layers. A stream is labeled "Unnamed Tributary to Big Pipe Creek".

**Map Contents Legend:**

- Parcel Boundaries / Real Property
- Basemap
  - Watershed Resources Improve
    - Upland Preservation
    - Upland Restoration
    - Wetland Preservation
      - Not Suitable
      - 1
      - 2
      - 3
      - 4
      - 5
    - Wetland Restoration
      - Not Suitable
      - 1
      - 2
      - 3
      - 4
      - 5
  - Riparian Preservation
  - Riparian Restoration
  - Stormwater Natural Infr
  - Stormwater Compromis
- Watershed Characteristics
  - Waters/Streams
    - Stream
    - Floodplain
    - Water Body
  - Water Quality Impairments
  - Physiographic Region
  - Geology
  - Wetland
  - Soils - Appears If Zoomed In

**Right Panel:**

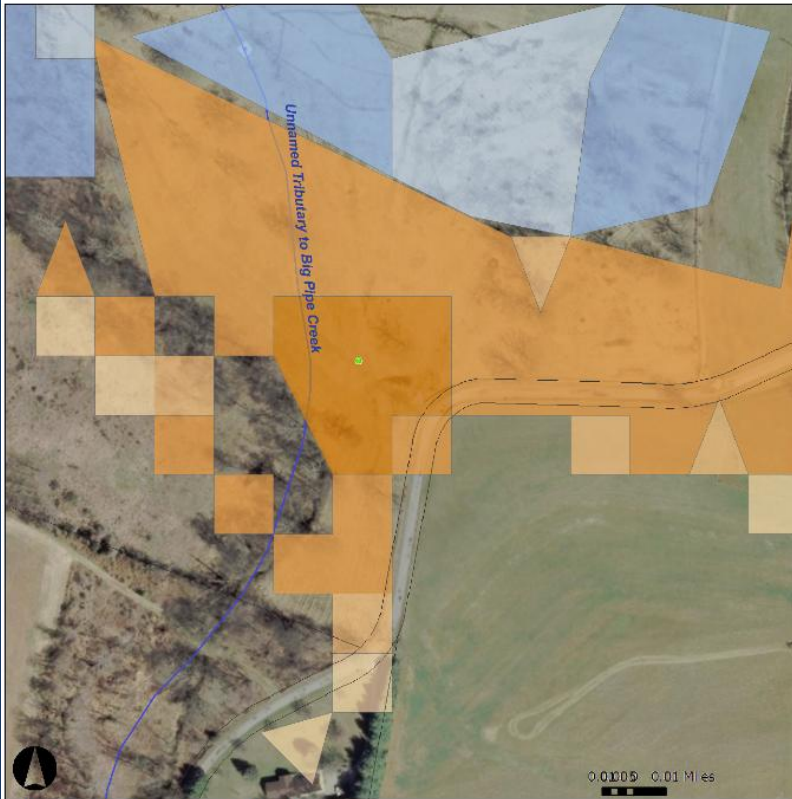
- Find Opportunities
- Location Details
- X/Y Location
- Zoom to County
- Zoom to Watershed
- Address Locator
- Print Map/Results





## Print Map/Results

### Watershed Resources Map



Map Projection: State Plane Maryland (NAD83 - Meters)

#### Selected Location - Coordinates

● Latitude/Longitude: 39.6599,-77.05192

#### Watershed Resources Improvement Opportunities

[Upland Preservation](#): 3  
[Upland Restoration](#): 4  
[Wetland Preservation](#): Not Suitable  
[Wetland Restoration](#): 5  
[Riparian Preservation](#): 3  
[Riparian Restoration](#): 3  
[Stormwater Natural Infrastructure Preservation](#): 1  
[Stormwater Compromised Infrastructure Restoration](#): 2

#### Watershed Characteristics:

[View Watershed Profile](#)  
 HUC: 020700090404  
 HUC Name: Upper Big Pipe Creek  
 Maryland 8 Digit Watershed: 02140304  
 Maryland 12 Digit Watershed: 021403040283

#### Selected Location Information

##### Waterways

Nearest Stream: Unnamed Tributary to Big Pipe Creek  
 Stream Use Designation: IV-P  
 Distance: 80 ft.  
 Location inside the floodplain.

Metadata: [Stream Use Designations](#) | [Floodplain](#)

##### Water Quality Impairments

[Metadata](#)  
 Impairments: Biological, Nutrients, Sediments

##### Wetlands

Wetlands of Special State Concern: None within 500 ft.  
 DNR: Type - Upland  
 NWI: Distance - 276 ft., Type - Freshwater Emergent Wetland

Metadata: [WSSC](#) | [DNR](#) | [NWI](#)

##### Green Infrastructure

There are no hubs within 500 ft.  
 Location inside a gap  
 Location inside a corridor

Metadata: [Hub](#) | [Gap](#) | [Corridor](#)

##### Blue Infrastructure

[Metadata](#)  
 There is no blue infrastructure within 500 ft.

##### Species Related Data

There are no forest interior dwelling species areas within 500 ft.

Metadata: [FIDs](#)

##### Soils

[Metadata](#)  
 Soil Type: Ht  
 Hydric: Hydric  
 Drainage: Poorly Drained  
 Prime Farm Land: Not prime

##### Land Use/Land Cover

Land Use Type (2002): Deciduous Forest  
 Land Use Type (2007): Pasture

Metadata: [Metadata](#) | [Metadata](#)

##### Physiographic Region

[Metadata](#)  
 Province: Piedmont Plateau Province

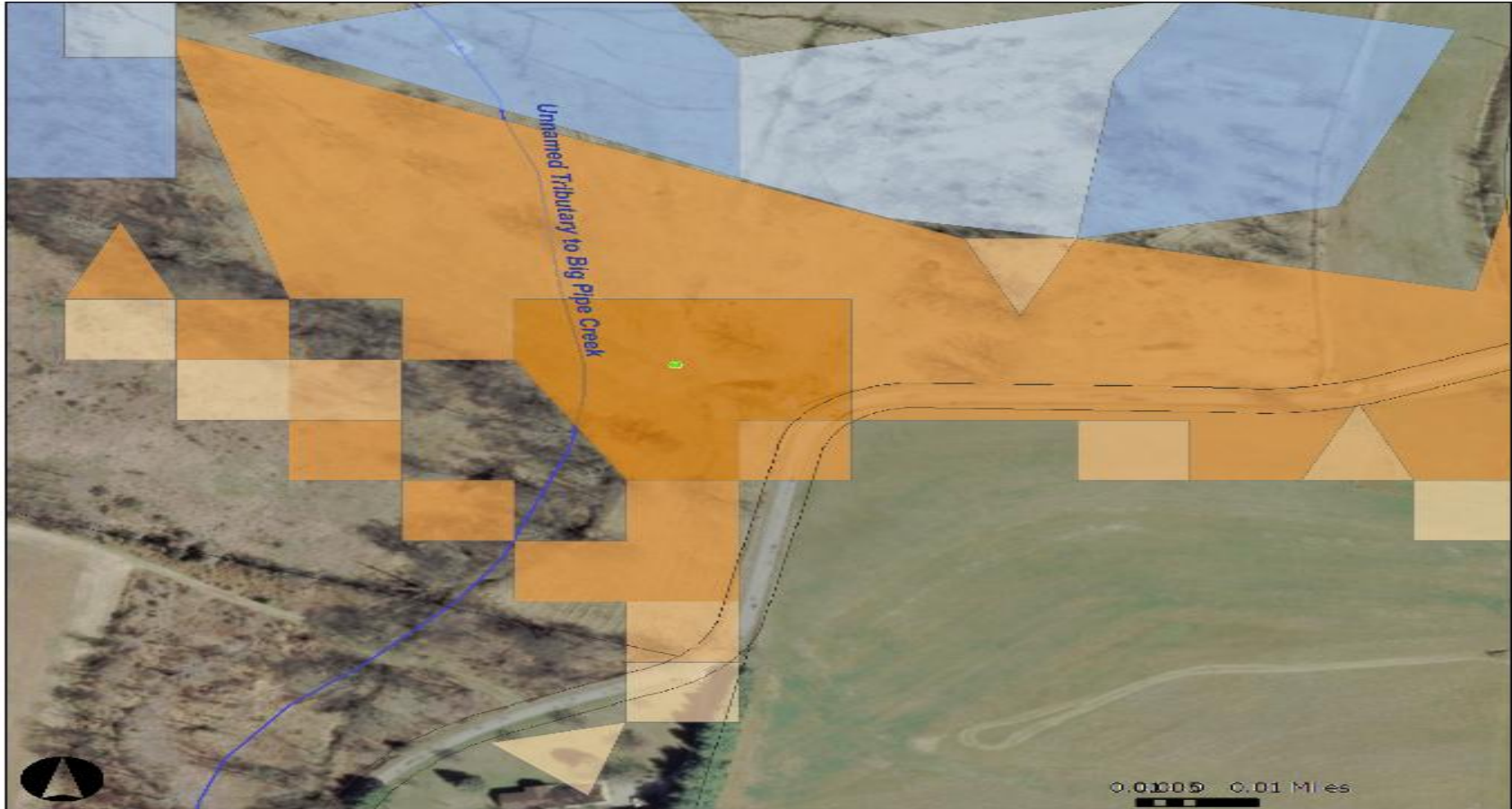
##### Geology

[Metadata](#)  
 Name: Marburg Schist



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## Watershed Resources Map



Map Projection: State Plane Maryland (NAD83 - Meters)

### Selected Location - Coordinates

Latitude/Longitude: 39.6599,-77.05192





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## Watershed Resources Improvement Opportunities

[Upland Preservation](#): 3  
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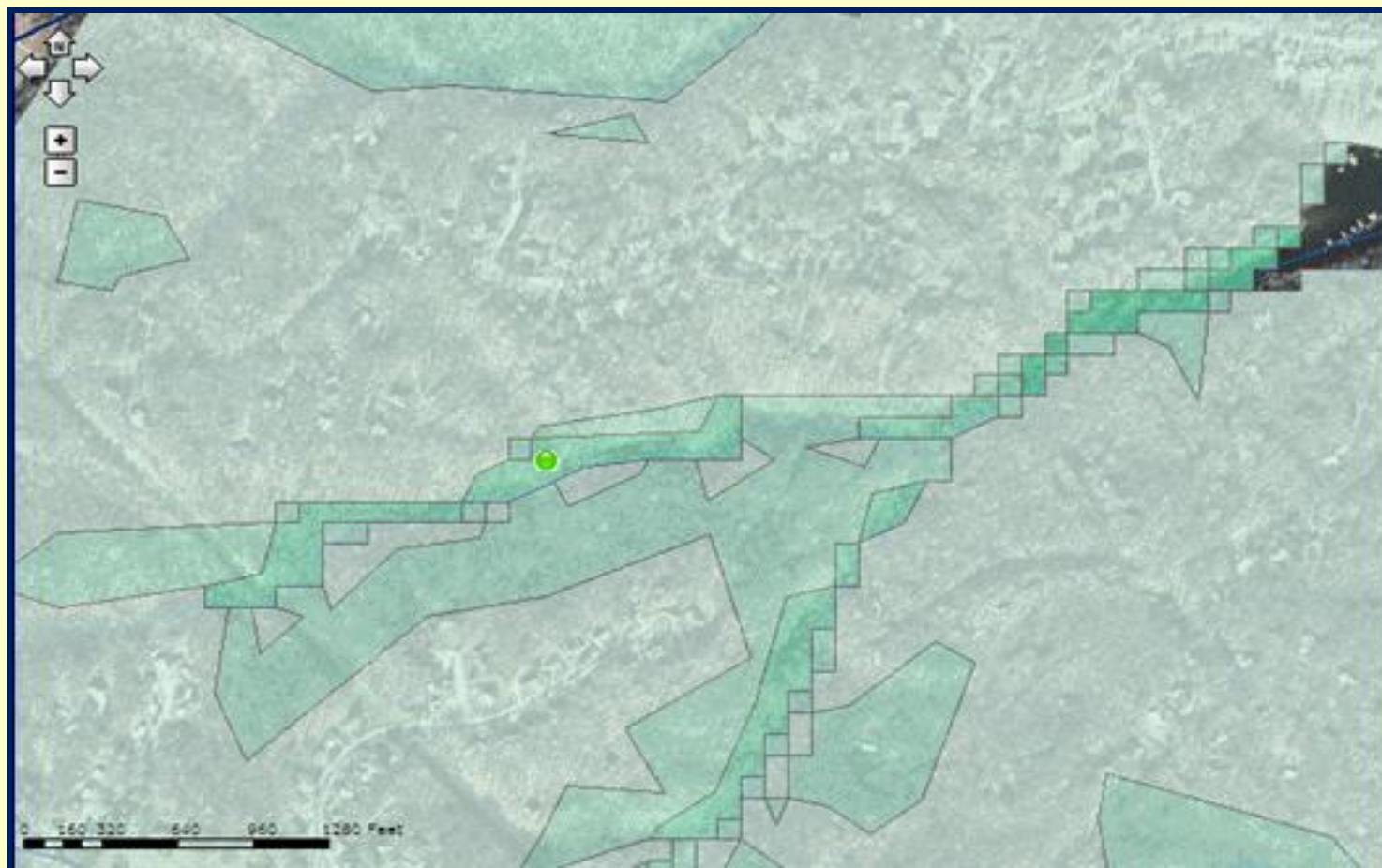
### Geology

[Metadata](#)  
Name: Marburg Schist





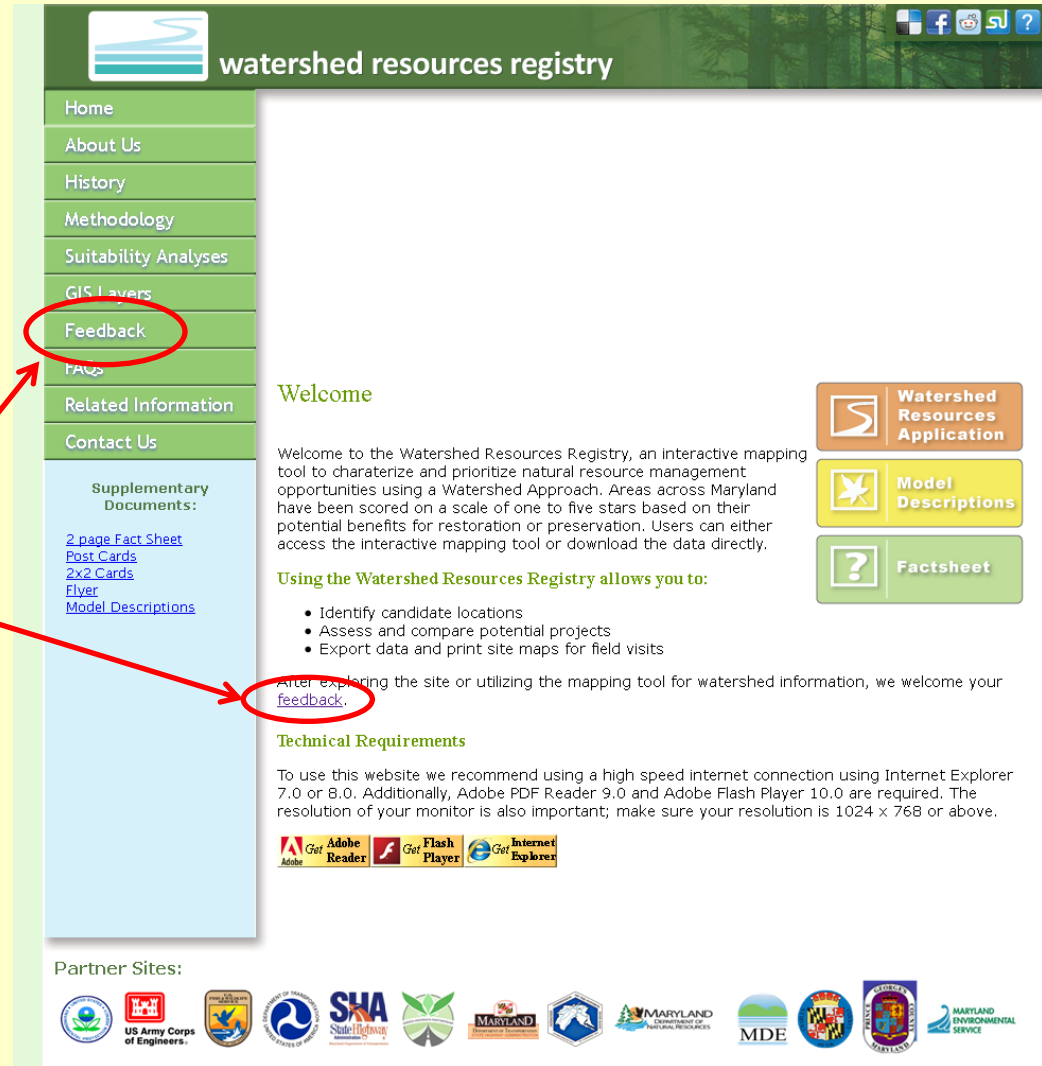
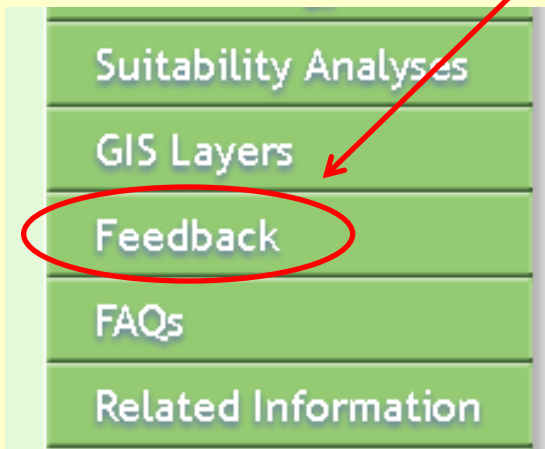
## Stormwater Preservation





## How to provide Feedback

- On the Menu located in the top-left of the website, click "Feedback"







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## Contribute Your Feedback

Please give us your feedback concerning your use of the WRR mapping tool.

Please select one:

- I would like to report a problem/issue
- I have a general comment

Which aspects of the WRR are you interested in? (Select all that apply)

- WRR Application Interface
- Accuracy/Relevancy of the basemap/data layers
- Website
- Mapping/General site information
- Other (Please specify below)

Which Suitability Analysis/Ecological opportunity are you interested in? (Select all that apply)

- Upland Preservation
- Upland Restoration
- Wetland Preservation
- Wetland Restoration
- Riparian Preservation
- Riparian Restoration
- Stormwater Natural Infrastructure Preservation
- Stormwater Compromised Infrastructure Restoration

Please describe the issue/comment.

If possible, please provide the coordinates of a site that demonstrates the issue (Decimal Degree format).

Latitude:  Longitude:

<http://www.watershedresourcesregistry.org/feedback.php>

Have you field-verified the results of the WRR Application?  Yes  No

Did the application results accurately depict what you found in the field?  Yes  No  Not Applicable

If not, please elaborate.

How could the WRR be enhanced or improved?

Would you like to be contacted regarding your comments?  Yes  No

Name (optional)

Email (optional)

Affiliation (optional)

- Government
- Private
- Non-Profit
- Citizen

Response Survey





## Recent and Current Events

- A series of training workshops were held from October - December 2012 at several agency locations
- A team of experts is being assembled to consult on the stormwater models
- User website and application are both live
  - [www.watershedresourcesregistry.org](http://www.watershedresourcesregistry.org)
- Upcoming private training opportunities
- Site registration being developed
- Currently soliciting feedback from participating agencies



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# THANK YOU

Contact Ralph Spagnolo with any  
further questions.

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[www.watershedresourcesregistry.org](http://www.watershedresourcesregistry.org)



US Army Corps  
of Engineers