



WATERSHED RESOURCES REGISTRY



Introductory Workshop, October 16th and 17th 2014

Transferring the WRR Proof of Concept

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Objectives

- Acknowledge Agency Investments
- Discuss rollout strategy for the Pilot
 - Philosophy
 - Project Details
 - Demonstration
- Next Steps



Acknowledgements

- Special thanks to:

- FHWA
- EPA
- USACE
- DNREC
- DELDOT



US Army Corps
of Engineers®



- For – Direct support and/or In-kind services



Philosophy

- Increase communication and collaboration
- Develop an adaptable framework to address watershed needs
- Develop baseline models using national datasets as a starting point
- Develop scaled down national version of GIS-Web application
- Begin understanding Watershed opportunities and characteristics that cross state boundaries



Project Details

- Established coordination with Federal Agencies
- Engaged Delaware (DNREC, DELDOT) - Presented initial proof of concept in developing wetland restoration and preservation models for Delaware using National datasets.
- Refined all Maryland models to use National data for Delaware (baseline only)
- QAQC'd baseline Delaware models
- Created standardized web application



Criteria Sheets for POC

- Used MD's models as starting point to develop baseline
- Focused Primarily on National Datasets
 - Floodplain – FEMA: <https://msc.fema.gov/portal>
 - Land Cover – MRLC: <http://www.mrlc.gov/nlcd2011.php>
 - Wetlands – NWI: <http://www.fws.gov/wetlands/Data/Data-Download.html>
 - Protected Land – USGS: <http://gapanalysis.usgs.gov/padus/data/download/>
 - Soils – USDA:
http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/home/?cid=nrcs142p2_053369
 - Hydro – USGS: <http://nhd.usgs.gov/>
 - Impervious Surface – MRLC: <http://www.mrlc.gov/nlcd2011.php>
 - Impaired Watershed – EPA:
<http://water.epa.gov/scitech/datait/tools/waters/data/downloads.cfm>



Factors for Wetland Preservation

Relative Factors

- ~~In a Biodiversity Conservation Network area (BionNet 1, 2, or 3)~~
- ~~In Biodiversity Conservation Network area (BioNet 4, 5 or new FIDS get ½ point)~~
- ~~In a Blue Infrastructure high priority watershed~~
- ~~In Chesapeake Bay Commission Critical Area (LDA or RCA only)~~
- ~~In Biological Restoration Initiative Watershed~~
- in a 100-year floodplain
- In a Green Infrastructure “hub”, “core”, or “corridor”
- ~~In a Healthy Watershed (Stronghold, spawning, cold water or Class III Trout)~~
- ~~In a Wetland of Special State Concern (WSSC)~~
- Near (within 200') but not in protected lands
- ~~In Potential Migration Zones for wetlands, marshes, etc.~~
- Near (within 200') but not in a stream or water body
- ~~Near (200') or in a GreenPrint Target Ecological Area~~
- is forested

Absolute Factors

- Must be a wetland
- Cannot already be protected



Factors for Wetland Restoration

Relative Factors

- ~~In Biodiversity Conservation Network area (BioNet 4, 5 or new FIDS get ½ point)~~
- ~~In a Blue Infrastructure high priority watershed~~
- ~~In Chesapeake Bay Commission Critical Area (LDA or RCA only)~~
- ~~In a Biological Restoration Initiative Watershed~~
- in a 100-year floodplain
- ~~In a Green Infrastructure “gap” area~~
- Near (200') or in a Green Infrastructure “hub”, “core” or “corridor”
- ~~Near (200') but not in a Wetland of Special State Concern~~
- Near (200') but not in protected lands
- ~~In Potential Migration Zones for wetlands, marshes, etc.~~
- Near (200') but not in a stream or wetland
- ~~Near (200') or in a GreenPrint Target Ecological Area~~
- Is locally impaired: impaired for Nitrogen, Phosphorus, or sedimentation

Absolute Factors

- Cannot be forested
- Cannot be a wetland
- Cannot be developed
- Must be on a very poorly drained, somewhat poorly drained, or poorly drained soils



Factors for Riparian Zone Preservation

Relative Factors

- ~~In a Biodiversity Conservation Network area (BionNet 1, 2, or 3)~~
- ~~In Biodiversity Conservation Network area (BioNet 4, 5 or new FIDS get ½ point)~~
- ~~In a Blue Infrastructure high priority watershed~~
- ~~In Chesapeake Bay Commission Critical Area (LDA or RCA only)~~
- ~~In a Biological Restoration Initiative Watershed~~
 - in a 100-year floodplain
 - is forested
- In a Green Infrastructure “hub”, “core”, or “corridor”
- ~~in a Wetland of Special State Concern~~
 - Near (200') but not in protected lands
- ~~In Potential Migration Zones for wetlands, marshes, etc.~~
- ~~Near (200') or in a GreenPrint Target Ecological Area~~
- ~~In a Healthy Watershed (Stronghold, spawning, cold water, or Class III trout)~~
 - is within 200' (1 point), 400' (2/3 point) or 600' (1/3 point) of a stream

Absolute Factors

- Cannot be protected
- Must be near (600') but not in a stream or water body



Factors for Riparian Zone Restoration

Relative Factors

- ~~In Biodiversity Conservation Network area (BioNet 4, 5 or new FIDS get ½ point)~~
- ~~In a Blue Infrastructure high priority watershed~~
- ~~In Chesapeake Bay Commission Critical Area (LDA or RCA only)~~
- ~~In a Biological Restoration Initiative Watershed~~
- In a 100-year floodplain
- ~~In a stressed stream channel: channelization and/or has a lack of riparian buffer~~
- Near (200') but not in protected lands
- In a Green Infrastructure “hub” or “core” (1 point) or “corridor” (1/2 point)
- ~~Near but not in a Wetland of Special State Concern~~
- ~~In Potential Migration Zones for wetlands, marshes, etc.~~
- ~~Near (200') or in a GreenPrint Target Ecological Area~~
- Is within 200' (1 point), 400' (2/3 point) or 600' (1/3 point) of a stream
- Is locally impaired: impaired for Nitrogen, Phosphorus, or sedimentation

Absolute Factors

- Cannot be forested
- Must be near (600') but not in a stream or water body



Factors for Upland Preservation

Relative Factors

- In a Biodiversity Conservation Network area (BionNet 1, 2, or 3)
- In Biodiversity Conservation Network area (BioNet 4, 5 or new FIDS get ½ point)
- In a Blue Infrastructure high priority watershed
- In Chesapeake Bay Commission Critical Area (LDA or RCA only)
- In Biological Restoration Initiative Watershed
- Is forested
- In a Green Infrastructure area (1 point for “hub” or “core”; ½ point for “corridor”)
- In Healthy Watershed (Stronghold, spawning, cold water or Class III Trout)
- In a Wetland of Special State Concern
- Near (within 200') but not in protected lands
- In Potential Migration Zones for wetlands, marshes, etc.
- Near (within 200') but not in a stream or water body
- Near (200') or in a GreenPrint Target Ecological Area

Absolute Factors

- Cannot be developed (commercial, institutional, high or medium density residential, transportation)
- Cannot be a protected
- Cannot be a wetland or open water



Factors for Upland Restoration

Relative Factors

- ~~In Biodiversity Conservation Network area (BioNet 4, 5 or new FIDS get ½ point)~~
- ~~In a Blue Infrastructure high-priority watershed~~
- ~~In Chesapeake Bay Commission Critical Area (LDA or RCA only)~~
- ~~In Biological Restoration Initiative Watershed~~
- In a Green Infrastructure area (1 point for “hub” or “core”; ½ point for “corridor”)
- Is locally impaired: impaired for Nitrogen, Phosphorus, or sedimentation
- ~~Near (200') but not in a Wetland of Special State Concern~~
- Near (200') but not in protected lands
- ~~In Potential Migration Zones for wetlands, marshes, etc.~~
- Near (within 200') but not in a stream or water body
- ~~Near (200') or in a GreenPrint Target Ecological Area~~

Absolute Factors

- Cannot be forested
- Cannot be a wetland
- Cannot be developed



Factors for Restoring Degraded/Failing Stormwater Infrastructure Systems

Relative Factors

- ~~• in a Blue Infrastructure watershed~~
- ~~• in a Biological Restoration Initiative (BRI) watershed~~
- ~~• in an area that was probably developed before 1985 (1 point) or between 1985 and 2000 (½ point)~~
- is area of relatively higher impervious surfaces
- in an impaired watershed (as indicated by §303-d)
- Is within 200' (1 point) or within 600' (½ point) of a stream designated for uses II, III or IV
- ~~• In a Stronghold Watershed (1 point for "1"; ½ point for "2")~~
- ~~• in a Tier II watershed~~

Absolute Factors

- Cannot be a wetland
- Cannot be in a floodplain
- Cannot be forested
- Cannot be in open water



Factors for Preserving Healthy Natural Stormwater Infrastructure

Relative Factors

- ~~in a Blue Infrastructure watershed~~
- in area with well-drained soils
- in a 100-year (1 points) or 500-year (½ point) flood plain
- within 100 feet (1point) or 500 feet (½ point) of a impaired (303-D listed) stream
- ~~in an area that drains to a 303-D listed stream~~
- ~~in a Tier II watershed~~
- ~~In a Stronghold Watershed (1 point for "1"; ½ point for "2")~~
- ~~in Chesapeake Bay Commission Critical Area (LDA or RCA only)~~
- in a Green Infrastructure hub , core, or corridor
- ~~in an area of potential Forest Interior Dwellings Species Habitat~~
- is forested riparian buffer (1 point if within 200' of stream, 2/3 point if within 400' of stream and 1/3 point if within 600' of stream)
- is forested
- is relatively high in impervious surfaces
- is forested near (200') or in an area where impervious surfaces are relatively higher
- ~~in an unprotected Targeted Ecologic Area (GreenPrint)~~
- ~~within 200 feet of a protected Targeted Ecologic Area (GreenPrint)~~
- ~~is near (200') but not in a protected Targeted Ecologic Area (GreenPrint)~~
- ~~in a Priority Funding Area~~
- in a wetland

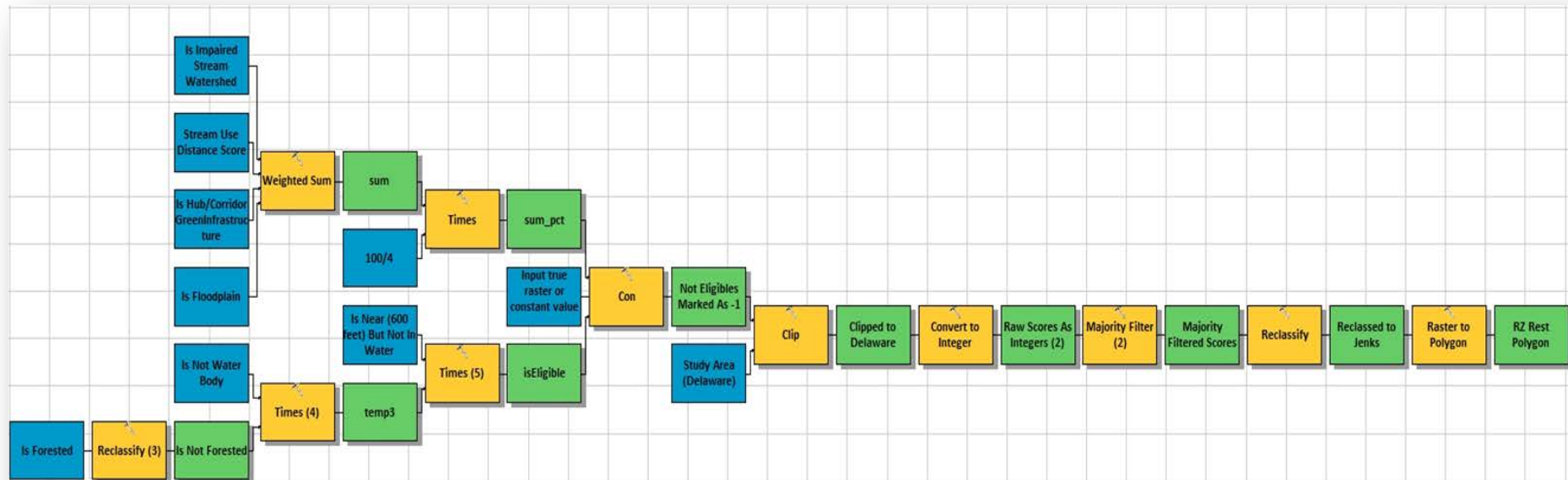
Absolute Factors

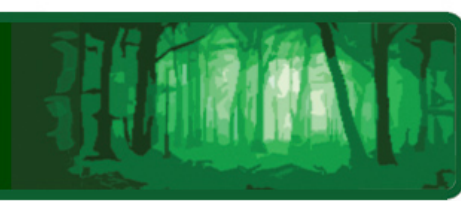
- cannot already be protected
- cannot be open water



Translating Criteria into Analysis

- Blue = Input (Source Data)
- Yellow = Geoprocessing Tool
- Green = Intermediate or Final Output Data
- _____ = Connectors Linking Inputs, Geoprocesses, and Outputs Together





Translating Criteria into Analysis Cont'd

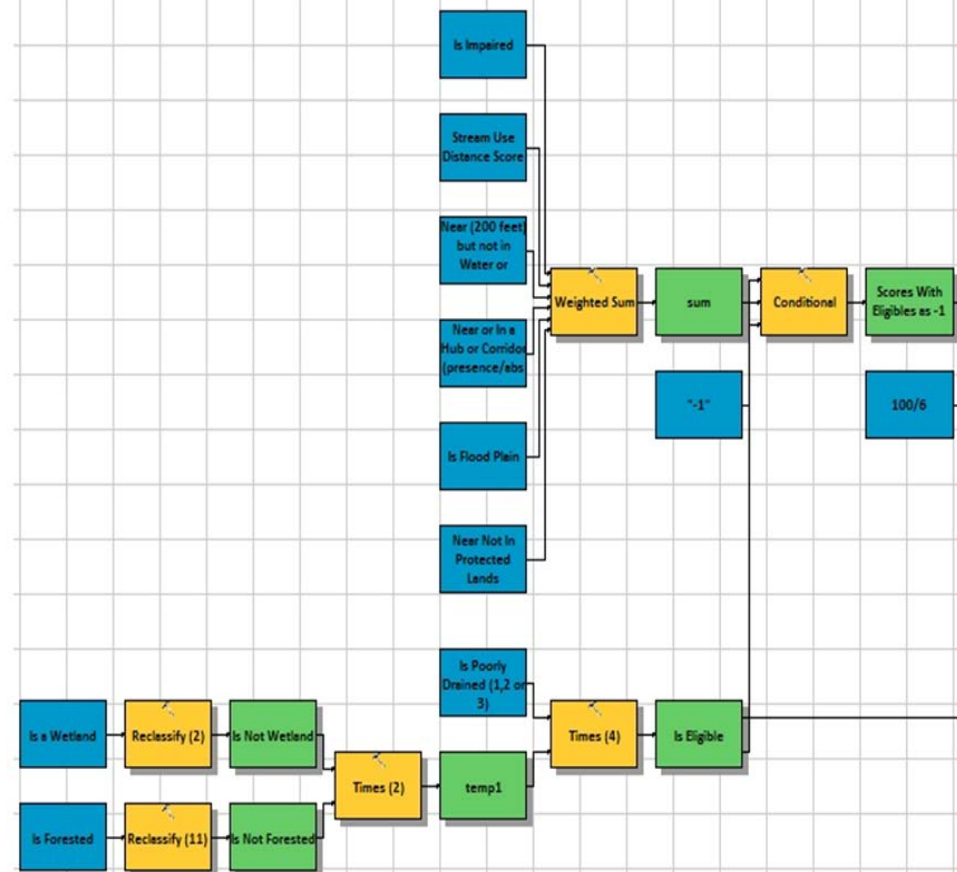
Factors for Wetland Restoration

Relative

- near (200') or in a Green Infrastructure hub, core, or corridor (State-Based Data)
- in a 100-year or 500-year floodplain (FEMA)
- in an impaired watershed (as indicated by §303-d) (EPA)
- near (200') but not in a protected land (USGS)
- near (200') but not in a stream or wetland (NHD/NWI)
- within 200' or within 600' of a stream (NHD)

Absolute

- cannot be a wetland (NWI)
- cannot be forested (NLCD)
- must be on a very poorly drained soil, somewhat poorly drained soil or poorly drained soil (USDA)



QA/QC process

- Established Testing Plan to ensure
 - Models run without error
 - Results are replicable
 - Parameters align with criteria

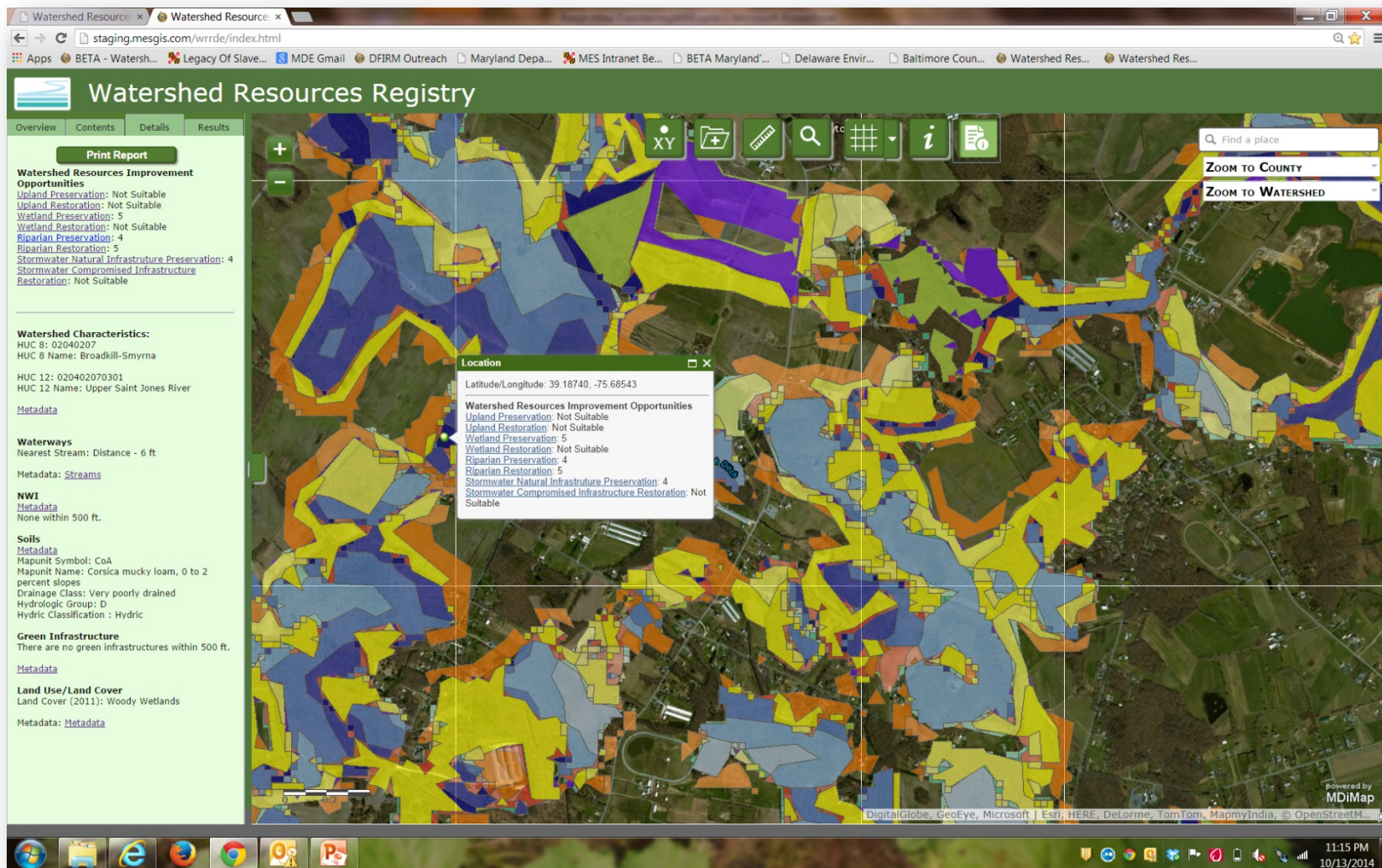
Criteria	HP	HR	RP	RR	UP	UR	WP	WR	# Of Models Used In	File Name
In a protected area	-1		-1		-1		-1		4	isprot
In a wetland	+	-			-1	-1	1	-1	6	iswetland
In a forested area (as mapped by MDP 2008, which includes forested wetlands)	+	-	+	-1	+	-1	+	-1	7	isforested
In a Green Infrastructure (1pt for hub and 1/2pt for corridor)	+		+	+	+	+	+		6	ishubcorr
Near (200ft) but not in a protected area					+		+	+	4	nniprot
Is water (open water)	-1		-1	-1	-1	-1			5	isopenwater
In Flood Plain (1pt for 100-year and 1/2pt for 500-year)	+	-	+	+				+	5	isfloodplain
Forested near (200ft) or in area where impervious surfaces might be relatively high	+								1	Not Included
On well drained soils	+								1	iswelldrained
In developed land use (urban, suburban, institutional, industrial, transportation)					-1	-1			2	isdeveloped
In impaired stream (as defined by 303-d of CWA) watershed	Input Layer(s)	File Name	Process Applied	Resulting Raster	File Name	Data Source	Conflicts	Comments		
Near (200ft) but not in stream or waterbody	Distance to Water or Stream	dist2water	Reclassify (0-91=1, 91=0, ND=0) to get areas near stream or water	Areas Near (200ft) Stream or Water	nniwa200	NHD	No	N/A		
On poorly drained soils										
Near (600ft) but not in stream or waterbody	Is Near (600ft) or in Water or Streams									
Near (200ft) or in Green Infrastructure (simple presence/absence)	Distance to Water or Stream	dist2water	Reclassify (0-165=1, 165=0, ND=0) to get areas near stream or water	Areas Near (600ft) Stream or Water	nniwa600	NHD	No	N/A		
On karst geology										
In area of higher impervious surface percentage	File Name	Process Applied	Resulting Raster	File Name	Data Source	Conflicts	Comments			
Probable Higher Impervious Surfaces	himpscty	Expand	Is Near or in Area of Higher Imperviousness	nearhimp	N/A	No	N/A			
(1) Is Near or in Area of Higher Imperviousness	(1) nearhimp	Times	Is Forested Near or in High Impervious Surface Areas	farhimp	N/A	No	N/A			
(2) Is Forested	(2) isforestcd									
(1) Stream Distance Score	(1) dist2water	Times	Is Forested Near Stream or Waterbody	farhimp	N/A	No	N/A			
(2) Is Forested	(2) isforestcd									
(1) Stream Use Score	(1) su_sct	Weighted Sum	Weighted sum of inputs	sum	N/A	No	N/A			
(2) Is in Green Infrastructure Hub and Corridor	(2) isgreeninf									
(3) Is Well Drained	(3) iswelldrained									
(4) Is Floodplain	(4) isfloodplain									
(5) Is a Wetland	(5) iswetland									
(6) Is Forested Near Stream or Waterbody	(6) farhimp									
(7) Is Forested Near or in High Impervious Surface Areas	(7) farhimp									
Weighted Sum	sum	Times (12.5 the number of	Score as Percentage	sum_pct	N/A	No	N/A			
Factors for Wetland Restoration										
Relative										
• near (200') or in a Green Infrastructure hub, core, or corridor (State-Based Data)	near200	eligible	No	N/A						
• in a 100-year or 500-year floodplain (FEMA)	flood100	eligible	No	N/A						
• in an impaired watershed (as indicated by §303-d) (EPA)	sum_less_imp	No	N/A							
• near (200') but not in a protected land (USGS)	near200not	No	N/A							
• near (200') but not in a stream or wetland (NHD/NWI)	near200not	No	N/A							
• within 200' or within 600' of a stream (NHD)	near200not	No	N/A							
Absolute										
• cannot be a wetland (NWI)	notwet	No	N/A							
• cannot be forested (NLCD)	notforest	No	N/A							
• must be on a very poorly drained soil, somewhat poorly drained soil or poorly drained soil (USDA)	notpoor	No	N/A							



QA/QC Findings

- Reducing number of relative factors resulted in less differentiation between the model outputs, particularly compared to Riparian Restoration verses Riparian Preservation
- Baseline models serve as a point of origin only
 - Quality and accuracy of model outputs will increase with additional stakeholder buy-in leveraging state-based data

Demonstration





Next Steps (Open Discussion)

- Document Challenges
- Identify Key Delaware Contacts
- Finalize TAC
- Establish Goals
- Conduct Data Inventory
- Refine Baseline Criteria
- Perform Detailed Analyses
- QA/QC & Publish
- Implement Data Management / Maintenance Plan



Group Exercise