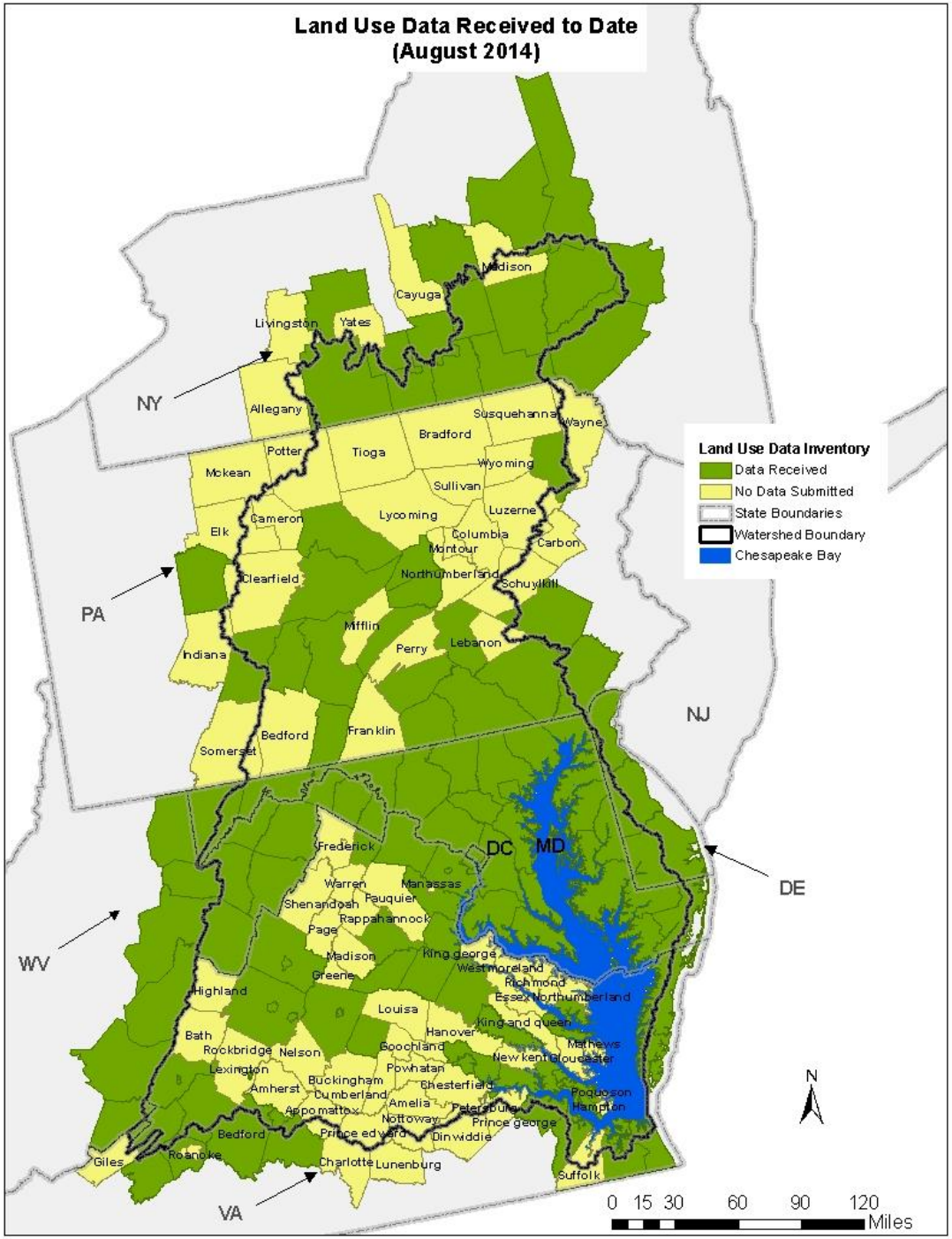
Phase 6 Land Use Data Status Update

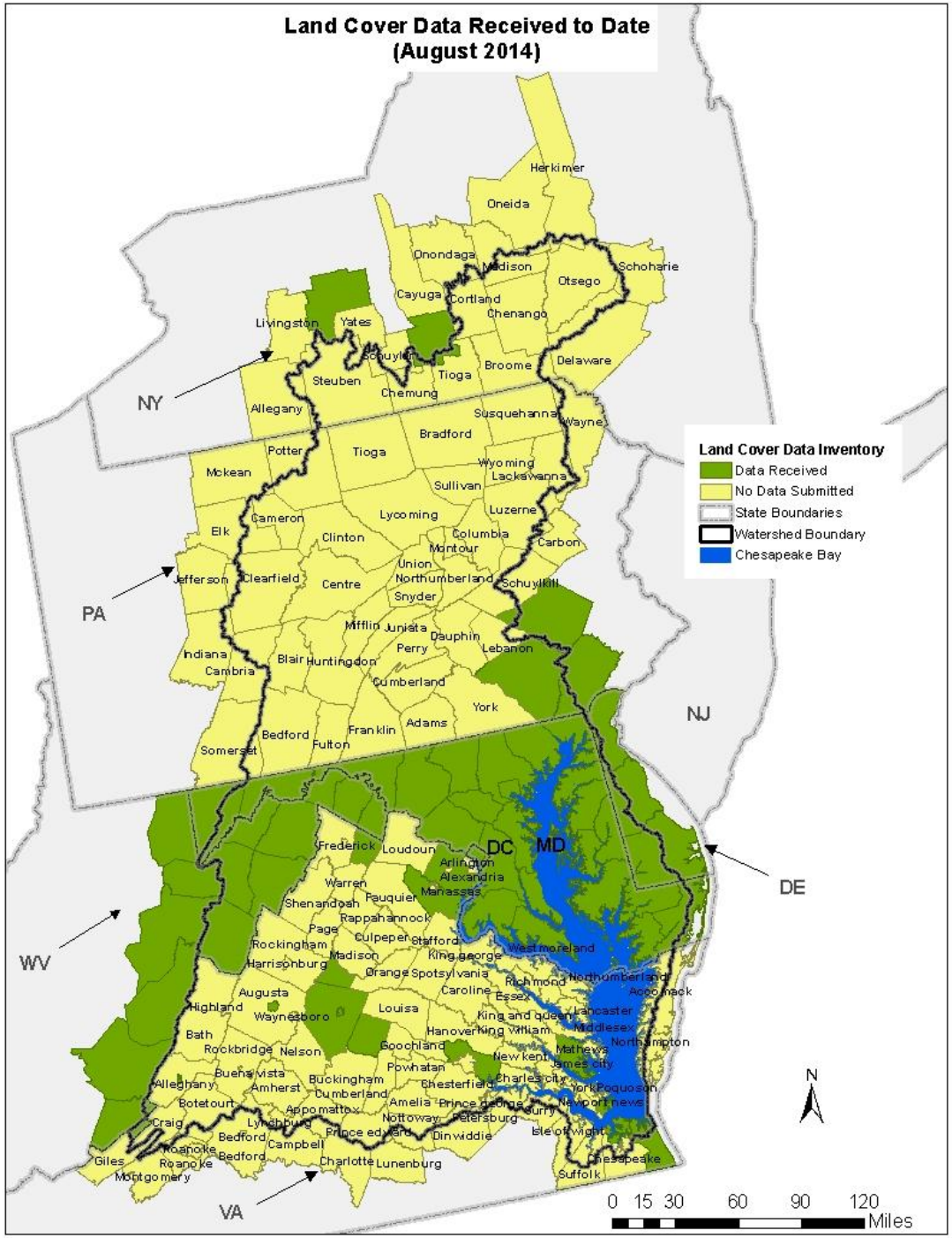
Peter Claggett

September 4, 2014
CBP Modeling Workgroup Call

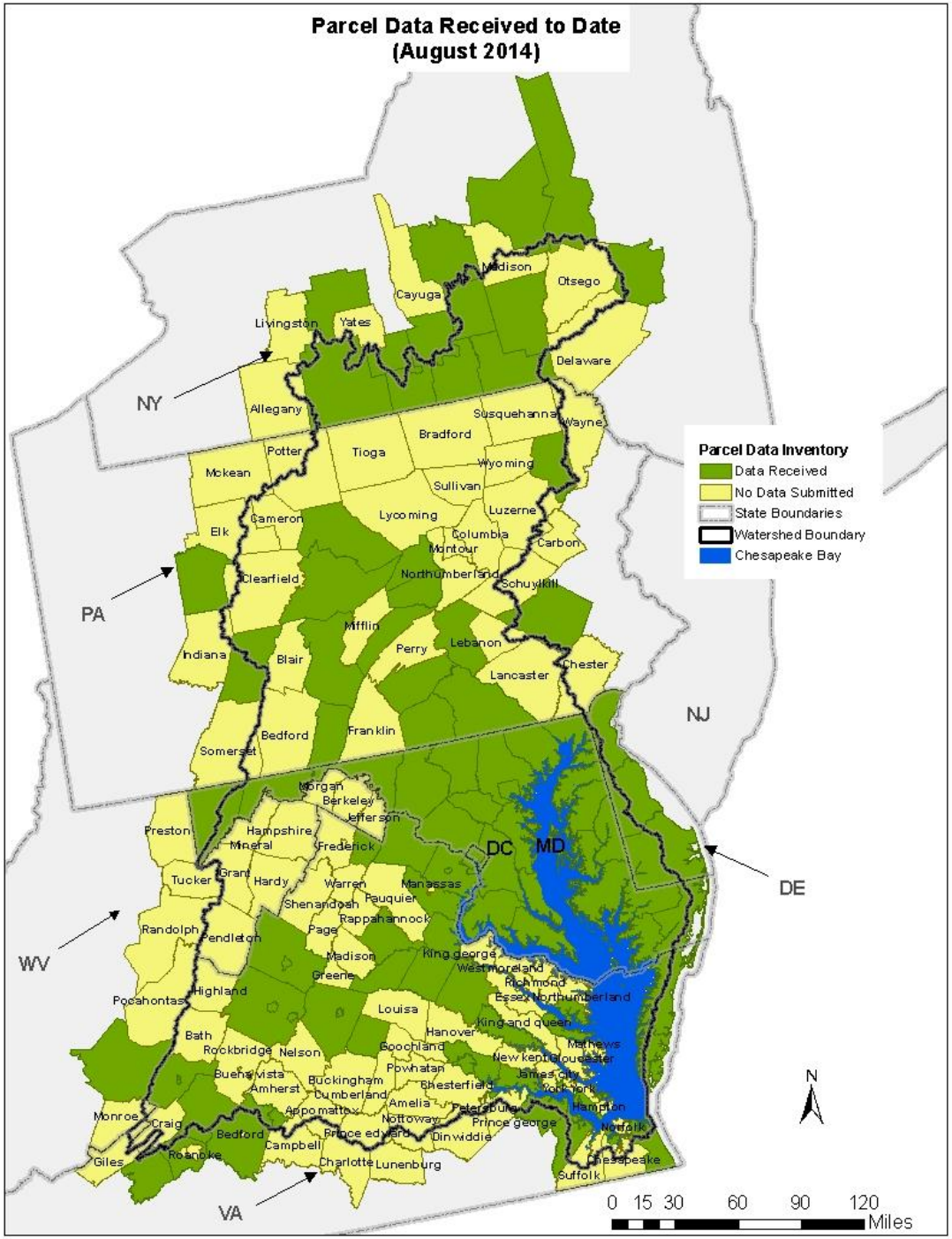
U.S. Department of the Interior
U.S. Geological Survey


Land Use Data Received to Date
(August 2014)
Land Use Data Inventory
Data Received
No Data Submitted
State Boundaries
Watershed Boundary
Chesapeake Bay
NY
PA
WV
VA
NJ
DE
MD
DC
Madison
Cayuga
Livingston
Yates
Allegany
Susquehanna
Wayne
Bradford
Potter
Tioga
Wyoming
Mckean
Sullivan
Cameron
Lycoming
Luzerne
Elk
Columbia
Montour
Carbon
Clearfield
Northumberland
Schuylkill
Mifflin
Perry
Lebanon
Indiana
Franklin
Bedford
Somerset
Frederick
Warren
Manassas
Pauquier
Shenandoah
Rappahannock
Page
Madison
King george
Westmoreland
Greene
Richmond
Highland
Essex
Northumberland
Louisa
King and queen
Bath
Hanover
Rockbridge
Nelson
Goochland
Mathews
New kent
Gloucester
Lexington
Powhatan
Buckingham
Amherst
Chesterfield
Cumberland
Pocahontas
Amelia
Hampton
Appomattox
Petersburg
Nottoway
Prince george
Bedford
Prince edward
Dinwiddie
Giles
Roanoke
Charlotte
Lunenburg
Suffolk
N
0 15 30 60 90 120
Miles

USGS


Land Cover Data Received to Date
(August 2014)
Land Cover Data Inventory
Data Received
No Data Submitted
State Boundaries
Watershed Boundary
Chesapeake Bay
NY
PA
WV
VA
NJ
DE
MD
DC
Herkimer
Oneida
Onondaga
Madison
Schoharie
Otsego
Cayuga
Cortland
Chenango
Livingston
Yates
Schuyler
Broome
Delaware
Tioga
Steuben
Chemung
Allegany
Susquehanna
Wayne
Bradford
Potter
Tioga
Wyoming
Lackawanna
Mckean
Sullivan
Luzerne
Cameron
Lycoming
Elk
Clinton
Columbia
Montour
Carbon
Union
Jefferson
Clearfield
Centre
Northumberland
Schuylkill
Snyder
Mifflin
Juniata
Dauphin
Perry
Lebanon
Indiana
Blair
Huntingdon
Cambria
Cumberland
York
Adams
Franklin
Bedford
Fulton
Somerset
Frederick
Loudoun
Arlington
Alexandria
Manassas
Warren
Pauquier
Shenandoah
Rappahannock
Page
Culpeper
Stafford
Westmoreland
Rockingham
Madison
King george
Harrisonburg
Orange
Spotsylvania
Caroline
Richmond
Northumberland
Accomack
Augusta
Essex
Highland
Louisa
Waynesboro
King and queen
Lancaster
Middlesex
Bath
Hanover
King william
Northampton
Rockbridge
Nelson
Goochland
Mathews
New kent
James city
Powhatan
Buena vista
Buckingham
Charles city
Alleghany
Amherst
Cumberland
Chesterfield
York
Poquoson
Botetourt
Amelia
Prince george
Surry
Newport news
Appomattox
Nottoway
Petersburg
Craig
Lynchburg
Prince edward
Dinwiddie
Isle of wight
Bedford
Campbell
Roanoke
Giles
Roanoke
Bedford
Charlotte
Lunenburg
Chesapeake
Montgomery
Suffolk
N
0 15 30 60 90 120
Miles

USGS


Parcel Data Received to Date
(August 2014)
Parcel Data Inventory
Data Received
No Data Submitted
State Boundaries
Watershed Boundary
Chesapeake Bay
NY
PA
WV
VA
NJ
DE
MD
DC
Madison
Otsego
Cayuga
Livingston
Yates
Delaware
Allegany
Susquehanna
Wayne
Bradford
Potter
Tioga
Wyoming
Mckean
Sullivan
Cameron
Lycoming
Luzerne
Elk
Columbia
Montour
Carbon
Clearfield
Northumberland
Schuylkill
Mifflin
Perry
Lebanon
Indiana
Blair
Chester
Lancaster
Bedford
Franklin
Somerset
Morgan
Berkeley
Jefferson
Preston
Hampshire
Mineral
Frederick
Tucker
Grant
Hardy
Warren
Manassas
Shenandoah
Pauquier
Rappahannock
Randolph
Pendleton
Page
Madison
King george
Westmoreland
Greene
Richmond
Highland
Essex
Northumberland
Pocahontas
Louisa
King and queen
Bath
Hanover
Rockbridge
Nelson
Goochland
Mathews
New kent
Gloucester
Powhatan
Buena vista
Amherst
Buckingham
James city
Chesterfield
York
Cumberland
Amelia
Hampton
Monroe
Appomattox
Petersburg
Nottoway
Prince george
Craig
Norfolk
Bedford
Prince edward
Dinwiddie
Campbell
Giles
Roanoke
Charlotte
Lunenburg
Chesapeake
Suffolk
N
0 15 30 60 90 120
Miles

USGS

Proposed Developed (aka “urban”) Land Uses

1 Developed		
	1.1 Impervious	
		1.1.1 Roads
		1.1.2 Buildings, parking lots, etc.
	1.2 Pervious	
		1.2.1 Turf grass
		1.2.2 Tree canopy
		1.2.3 Open space
	1.3 Construction	
	1.4 Extractive	

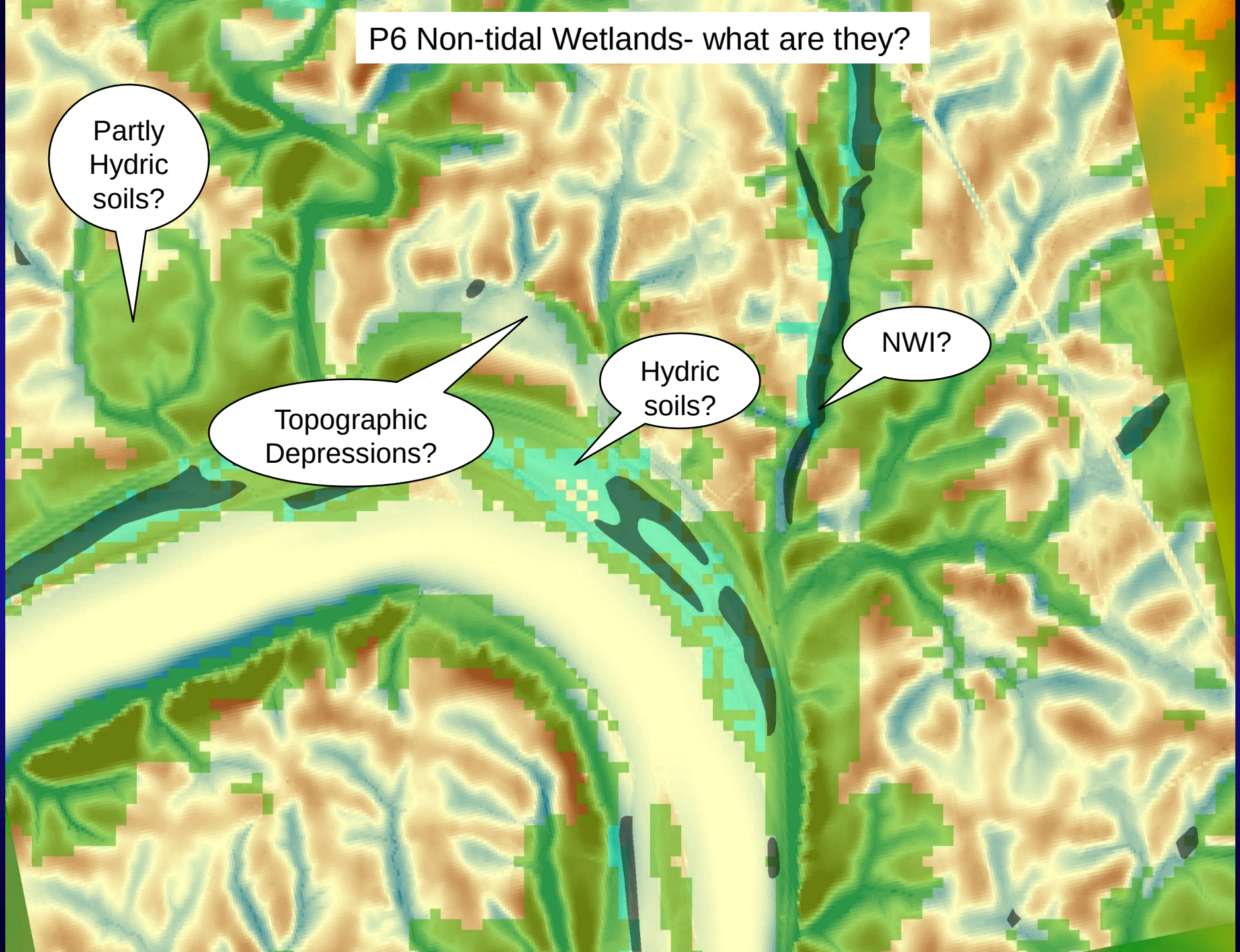
USGS

2 Agriculture			
	2.1 Commodity crops		
		2.1.1 Corn	
			Grain (dbl. cropped vs fall fallow)
			Silage (dbl. cropped vs fall fallow)
		2.1.2 Soybeans	
			Fall fallow
			Double cropped
		2.1.3 Small grains	
			Fall fallow
			Forage
	2.2 Hay and Legume forage		
		2.2.1 Alfalfa and other legumes	
		2.2.2 Non-legume forage	
		2.2.3 Pasture and pastured cropland	
	2.3 Speciality & Other crops		
		2.3.1 Vines	
			High vs medium vs low input
		2.3.2 Low cover	
			High vs medium vs low input
		2.3.3 High cover	
			High vs medium vs low input
	2.4 Farmsteads		
		2.4.1 Animal	
			Impervious vs Pervious
		2.4.2 Non-animal	
			Impervious vs Pervious

Proposed Natural Land Uses

3 Natural		
	3.1 Forests	
		3.1.1 Forest (undisturbed)
		3.1.3 Harvested
		3.1.4 Disturbed (insect, fire)
	3.2 Scrub/shrub/grass	
	3.2 Wetlands	
		3.2.1 Tidal emergent
		3.2.2 Fresh emergent
		3.2.3 Non-tidal woody
	3.3 Water (non-tidal)	

USGS


P6 Non-tidal Wetlands- what are they?
Partly Hydric soils?
Topographic Depressions?
Hydric soils?
NWI?

Proposed Sources and Overlays

Phase 6 Sources:	
4 Wastewater	
	4.1 Population on Sewer
	4.2 Population on Septic
5 Degraded stream corridors	
	5.1 Urban degraded (stream miles)
	5.2 Rural degraded (stream miles)
Phase 6 Overlays:	
	Riparian/floodplain corridors
	MS4 areas
	CSS areas
	Federal properties

USGS

Role of Stream Corridor Characteristics in Phase 6

1. Assess fluvial geomorphic characteristics of all stream corridors.

2. Assess probability of stream corridors functioning as sediment sources or sinks following methods from Schenk et al., 2013.

3. Determine proportions of sediment load originating from stream banks vs. upland sources and use to cap potential of runoff reduction and stream restoration BMPs.
   - Use empirical models relating stream corridor and catchment characteristics to loads (e.g., SPARROW)
   - Compare outfall vs. monitored loads

4. Use proportions and stream characteristics to allocate TSS loads to sources and to adjust sediment delivery factors for major land uses within each river segment.

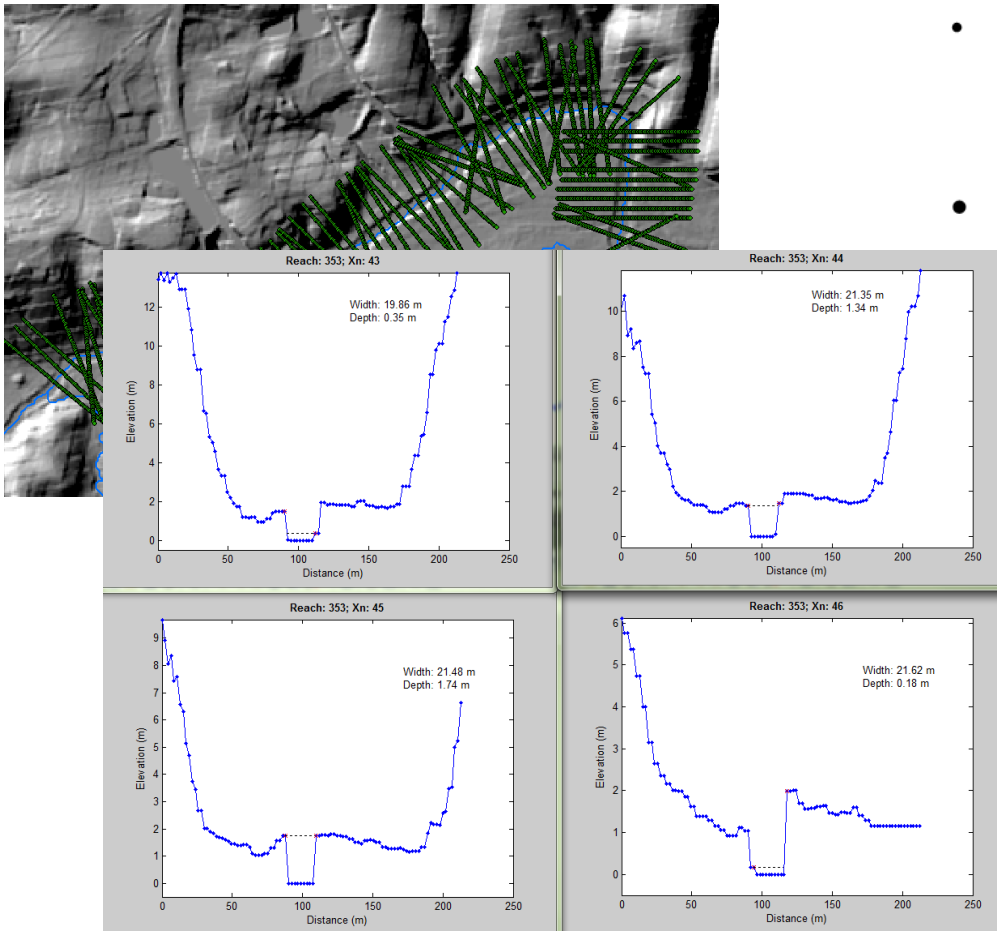
USGS

Stream Corridor Characteristics

- Drainage area size, land use, impervious surface, and hydrologic soil group
- Channel slope
- Floodplain width
- Riparian width/type
- Sinuosity
- Bank height
- Channel width
- Storm drain network density
- Potential ratios?
- Estimated source/sink potential from Schenk et al.
- Others available from geospatial data?

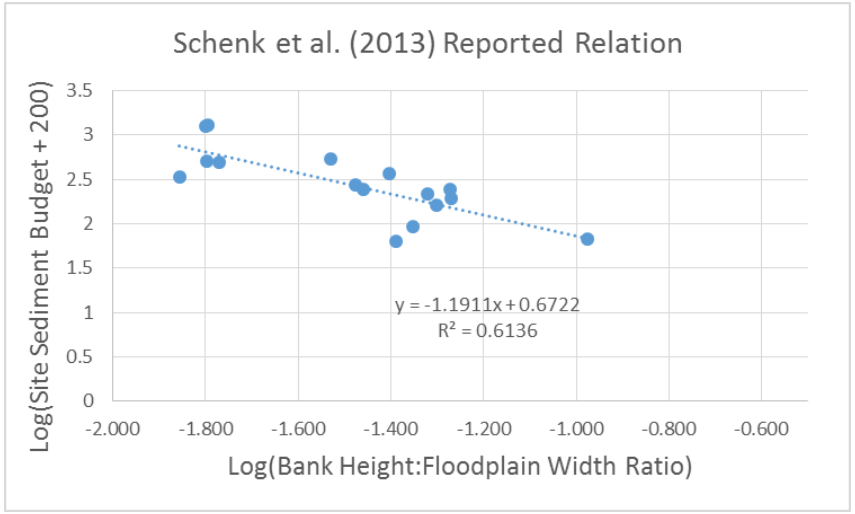
Characterizing Bank Height and Floodplain Width

Spatial analysis estimating Stream Parameters



Apply Schenk et al. (2013) net sediment balance model

- $Log(Sediment\ budget\ (kg\ per\ m\ per\ year)\ 200) = -1.19 * Log\left(\frac{bank\ height\ (m)}{floodplain\ width\ (m)}\right) + 0.672$
- Net Neutral Example:
  - Bank height = 3 feet
  - floodplain width = 70 feet



Peter Claggett, Geographer
U.S. Geological Survey

pclaggett@usgs.gov
pclagget@chesapeakebay.net

USGS