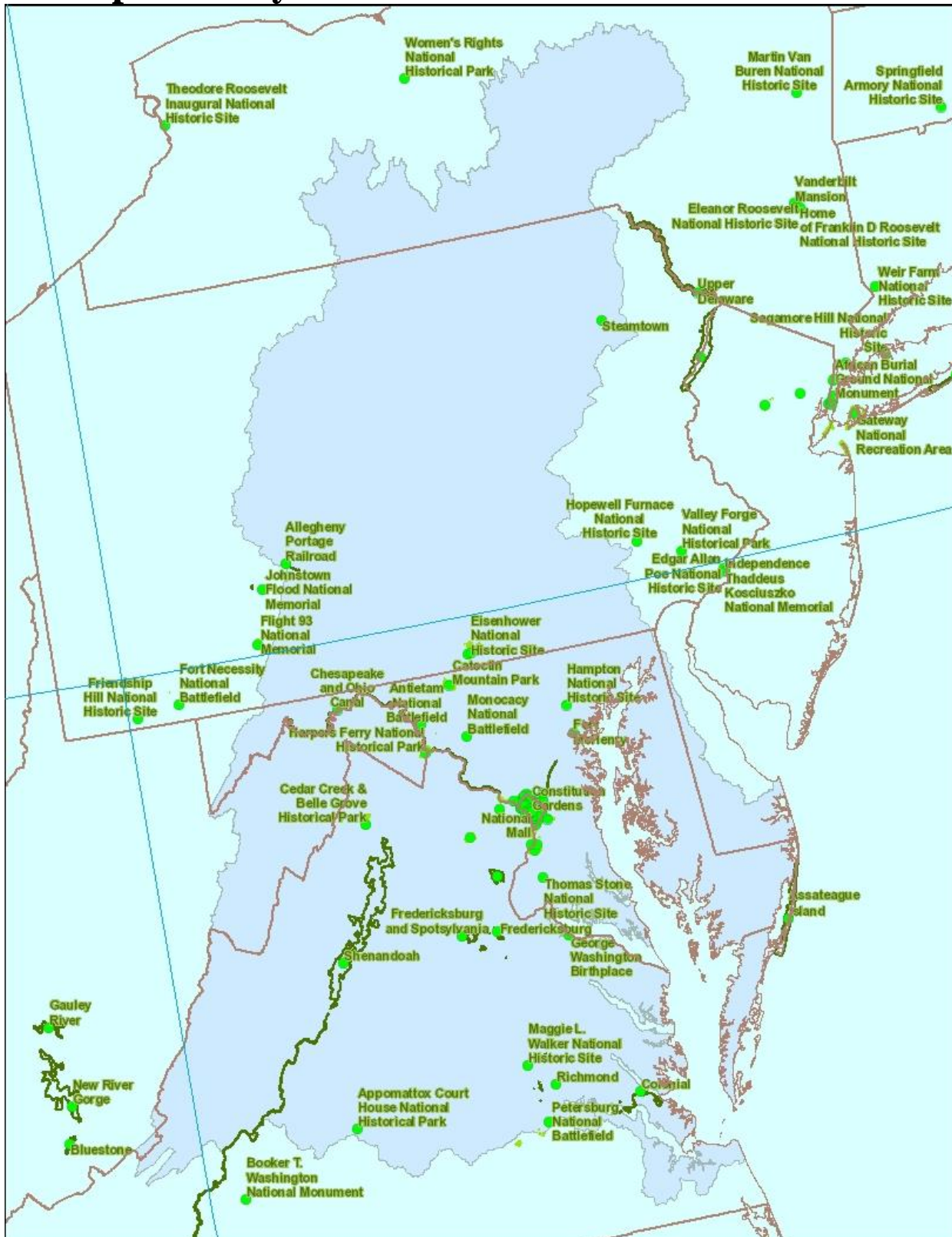


## In Situ Measurements

# National Park Service Stream Health Monitoring in the Chesapeake Bay Watershed



## In Situ Measurements

Parameter	Monthly in situ with portable multisonde	Continuously, every 15 minutes	Data Availability
Temperature	Antietam NB Catoctin Mountain Park George Washington Memorial Parkway Harpers Ferry NHP Manassas NBP Monocacy NB Nat'l Capital Parks -East Prince William Forest Park Rock Creek Park Wolf Trap NP for the Performing Arts	Catoctin Mountain Park Manassas NBP Prince William Forest Park Rock Creek Park Wolf Trap NP for the Performing Arts	<a href="http://spark.rstudio.com/johnpaul/Water/">http://spark.rstudio.com/johnpaul/Water/</a> and by request from Geoffrey_Sanders@nps.gov
	Appomattox Court House National Historical Park (APCO) Eisenhower National Historic Site (EISE) Fredericksburg & Spotsylvania National Military Park (FRSP) Gettysburg National Military Park (GETT) Petersburg National Battlefield (PETE) Richmond National Battlefield Park (RICH) <u>Shenandoah National Park (SHEN)</u>		by request from <a href="mailto:Mark_Johnson@nps.gov">Mark_Johnson@nps.gov</a>
pH	Antietam NB Catoctin Mountain Park George Washington Memorial Parkway Harpers Ferry NHP Manassas NBP Monocacy NB Nat'l Capital Parks -East Prince William Forest Park Rock Creek Park Wolf Trap NP for the Performing Arts	Catoctin Mountain Park Manassas NBP Prince William Forest Park Rock Creek Park Wolf Trap NP for the Performing Arts	<a href="http://spark.rstudio.com/johnpaul/Water/">http://spark.rstudio.com/johnpaul/Water/</a> and by request from Geoffrey_Sanders@nps.gov
	Appomattox Court House National Historical Park (APCO) Eisenhower National Historic Site (EISE) Fredericksburg & Spotsylvania National Military Park (FRSP) Gettysburg National Military Park (GETT) Petersburg National Battlefield (PETE) Richmond National Battlefield Park (RICH) <u>Shenandoah National Park (SHEN)</u>		by request from <a href="mailto:Mark_Johnson@nps.gov">Mark_Johnson@nps.gov</a>
Specific conductance	Antietam NB Catoctin Mountain Park George Washington Memorial Parkway Harpers Ferry NHP Manassas NBP Monocacy NB Nat'l Capital Parks -East	Catoctin Mountain Park Manassas NBP Prince William Forest Park Rock Creek Park Wolf Trap NP for the Performing Arts	<a href="http://spark.rstudio.com/johnpaul/Water/">http://spark.rstudio.com/johnpaul/Water/</a> and by request from Geoffrey_Sanders@nps.gov

## In Situ Measurements

Parameter	Monthly in situ with portable multisonde	Continuously, every 15 minutes	Data Availability
	Prince William Forest Park Rock Creek Park Wolf Trap NP for the Performing Arts		
	Appomattox Court House National Historical Park (APCO) Eisenhower National Historic Site (EISE) Fredericksburg & Spotsylvania National Military Park (FRSP) Gettysburg National Military Park (GETT) Petersburg National Battlefield (PETE) Richmond National Battlefield Park (RICH) <u>Shenandoah National Park (SHEN)</u>		by request from <a href="mailto:Mark_Johnson@nps.gov">Mark_Johnson@nps.gov</a>
Dissolved oxygen	Antietam NB Catoclin Mountain Park George Washington Memorial Parkway Harpers Ferry NHP Manassas NBP Monocacy NB Nat'l Capital Parks -East Prince William Forest Park Rock Creek Park Wolf Trap NP for the Performing Arts	Catoclin Mountain Park Manassas NBP Prince William Forest Park Rock Creek Park Wolf Trap NP for the Performing Arts	<a href="http://spark.rstudio.com/johnpaul/Water/">http://spark.rstudio.com/johnpaul/Water/</a> and by request from <a href="mailto:Geoffrey_Sanders@nps.gov">Geoffrey_Sanders@nps.gov</a>
	Appomattox Court House National Historical Park (APCO) Eisenhower National Historic Site (EISE) Fredericksburg & Spotsylvania National Military Park (FRSP) Gettysburg National Military Park (GETT) Petersburg National Battlefield (PETE) Richmond National Battlefield Park (RICH) <u>Shenandoah National Park (SHEN)</u>		by request from <a href="mailto:Mark_Johnson@nps.gov">Mark_Johnson@nps.gov</a>
Total Dissolved Solids	Antietam NB Catoclin Mountain Park George Washington Memorial Parkway Harpers Ferry NHP Manassas NBP Monocacy NB Nat'l Capital Parks -East Prince William Forest Park Rock Creek Park Wolf Trap NP for the Performing Arts		<a href="http://spark.rstudio.com/johnpaul/Water/">http://spark.rstudio.com/johnpaul/Water/</a> and by request from <a href="mailto:Geoffrey_Sanders@nps.gov">Geoffrey_Sanders@nps.gov</a>

## In Situ Measurements

Parameter	Monthly in situ with portable multisonde	Continuously, every 15 minutes	Data Availability
Flow	Antietam NB Catoctin Mountain Park George Washington Memorial Parkway Harpers Ferry NHP Manassas NBP Monocacy NB Nat'l Capital Parks -East Prince William Forest Park Rock Creek Park Wolf Trap NP for the Performing Arts		<a href="http://spark.rstudio.com/johnpaul/Water/">http://spark.rstudio.com/johnpaul/Water/</a> and by request from <a href="mailto:Geoffrey_Sanders@nps.gov">Geoffrey_Sanders@nps.gov</a>
Discharge	Antietam NB Catoctin Mountain Park George Washington Memorial Parkway Harpers Ferry NHP Manassas NBP Monocacy NB Nat'l Capital Parks -East Prince William Forest Park Rock Creek Park Wolf Trap NP for the Performing Arts		<a href="http://spark.rstudio.com/johnpaul/Water/">http://spark.rstudio.com/johnpaul/Water/</a> and by request from <a href="mailto:Geoffrey_Sanders@nps.gov">Geoffrey_Sanders@nps.gov</a>
Depth	Antietam NB Catoctin Mountain Park George Washington Memorial Parkway Harpers Ferry NHP Manassas NBP Monocacy NB Nat'l Capital Parks -East Prince William Forest Park Rock Creek Park Wolf Trap NP for the Performing Arts	Catoctin Mountain Park Manassas NBP Prince William Forest Park Rock Creek Park Wolf Trap NP for the Performing Arts	<a href="http://spark.rstudio.com/johnpaul/Water/">http://spark.rstudio.com/johnpaul/Water/</a> and by request from <a href="mailto:Geoffrey_Sanders@nps.gov">Geoffrey_Sanders@nps.gov</a>

## Grab Samples with Laboratory Analyses

Parameter	Monthly with grab samples	Quantitative Observation	Data Availability
Acid Neutralizing Capacity	Antietam NB Catoctin Mountain Park George Washington Memorial Parkway Harpers Ferry NHP Manassas NBP Monocacy NB Nat'l Capital Parks -East Prince William Forest Park Rock Creek Park Wolf Trap NP for the Performing Arts		<a href="http://spark.rstudio.com/johnpaul/Water/">http://spark.rstudio.com/johnpaul/Water/</a> and by request from <a href="mailto:Geoffrey_Sanders@nps.gov">Geoffrey_Sanders@nps.gov</a>
	Appomattox Court House National Historical Park (APCO) Eisenhower National Historic Site (EISE) Fredericksburg & Spotsylvania National Military Park (FRSP) Gettysburg National Military Park (GETT) Petersburg National Battlefield (PETE) Richmond National Battlefield Park (RICH) <u>Shenandoah National Park (SHEN)</u>		by request from Mark_Johnson@nps.gov
Turbidity	George Washington Birthplace National Historic Site		by request from Dennis-Skidds@nps.gov
		Appomattox Court House National Historical Park (APCO) Eisenhower National Historic Site (EISE) Fredericksburg & Spotsylvania National Military Park (FRSP) Gettysburg National Military Park (GETT) Petersburg National Battlefield (PETE) Richmond National Battlefield Park (RICH) <u>Shenandoah National Park (SHEN)</u>	by request from Mark_Johnson@nps.gov
Nitrate	Antietam NB Catoctin Mountain Park George Washington Memorial Parkway Harpers Ferry NHP Manassas NBP Monocacy NB Nat'l Capital Parks -East Prince William Forest Park Rock Creek Park Wolf Trap NP for the Performing Arts		<a href="http://spark.rstudio.com/johnpaul/Water/">http://spark.rstudio.com/johnpaul/Water/</a> and by request from <a href="mailto:Geoffrey_Sanders@nps.gov">Geoffrey_Sanders@nps.gov</a>
	Appomattox Court House National Historical Park (APCO) Eisenhower National Historic Site (EISE) Fredericksburg & Spotsylvania National Military Park (FRSP) Gettysburg National Military Park (GETT) Petersburg National Battlefield (PETE)		by request from Mark_Johnson@nps.gov

## Grab Samples with Laboratory Analyses

Parameter	Monthly with grab samples	Quantitative Observation	Data Availability
	Richmond National Battlefield Park (RICH) <u>Shenandoah National Park (SHEN)</u>		
Phosphorus	Antietam NB Catoclin Mountain Park George Washington Memorial Parkway Harpers Ferry NHP Manassas NBP Monocacy NB Nat'l Capital Parks -East Prince William Forest Park Rock Creek Park Wolf Trap NP for the Performing Arts		<a href="http://spark.rstudio.com/johnpaul/Water/">http://spark.rstudio.com/johnpaul/Water/</a> and by request from <a href="mailto:Geoffrey_Sanders@nps.gov">Geoffrey_Sanders@nps.gov</a>
	Appomattox Court House National Historical Park (APCO) Eisenhower National Historic Site (EISE) Fredericksburg & Spotsylvania National Military Park (FRSP) Gettysburg National Military Park (GETT) Petersburg National Battlefield (PETE) Richmond National Battlefield Park (RICH) <u>Shenandoah National Park (SHEN)</u>		by request from <a href="mailto:Mark_Johnson@nps.gov">Mark_Johnson@nps.gov</a>
Cl, NH4, SO4,Ca, Mg, K, Na, DOC, inorganic monomeric aluminum, silica	Appomattox Court House National Historical Park (APCO) Eisenhower National Historic Site (EISE) Fredericksburg & Spotsylvania National Military Park (FRSP) Gettysburg National Military Park (GETT) Petersburg National Battlefield (PETE) Richmond National Battlefield Park (RICH) <u>Shenandoah National Park (SHEN)</u>		by request from <a href="mailto:Mark_Johnson@nps.gov">Mark_Johnson@nps.gov</a>

## Biological Indices

Parameter	Annually	Data Availability
Benthic Macroinvertebrates	Antietam NB Catoctin Mountain Park George Washington Memorial Parkway Harpers Ferry NHP Manassas NBP Monocacy NB Nat'l Capital Parks -East Prince William Forest Park Rock Creek Park Wolf Trap NP for the Performing Arts	by request from <a href="mailto:Geoffrey_Sanders@nps.gov">Geoffrey_Sanders@nps.gov</a>
	Appomattox Court House National Historical Park (APCO) Eisenhower National Historic Site (EISE) Fredericksburg & Spotsylvania National Military Park (FRSP) Gettysburg National Military Park (GETT) Petersburg National Battlefield (PETE) Richmond National Battlefield Park (RICH) <u>Shenandoah National Park (SHEN)</u>	by request from Mark_Johnson@nps.gov
Fish	Antietam NB Catoctin Mountain Park George Washington Memorial Parkway Harpers Ferry NHP Manassas NBP Monocacy NB Nat'l Capital Parks -East Prince William Forest Park Rock Creek Park Wolf Trap NP for the Performing Arts	by request from <a href="mailto:Geoffrey_Sanders@nps.gov">Geoffrey_Sanders@nps.gov</a>
	<u>Shenandoah National Park (SHEN)</u>	By request from Jim_Schaberl@nps.gov
Amphibians	Chesapeake & Ohio Canal NHP Manassas NBP Prince William Forest Park Rock Creek Park	and by request from <a href="mailto:Geoffrey_Sanders@nps.gov">Geoffrey_Sanders@nps.gov</a>

Biological Indices

Parameter	Annually	Data Availability
Physical Habitat Index	Antietam NB Catoctin Mountain Park George Washington Memorial Parkway Harpers Ferry NHP Manassas NBP Monocacy NB Nat'l Capital Parks -East Prince William Forest Park Rock Creek Park Wolf Trap NP for the Performing Arts	by request from <a href="mailto:Geoffrey_Sanders@nps.gov">Geoffrey_Sanders@nps.gov</a>