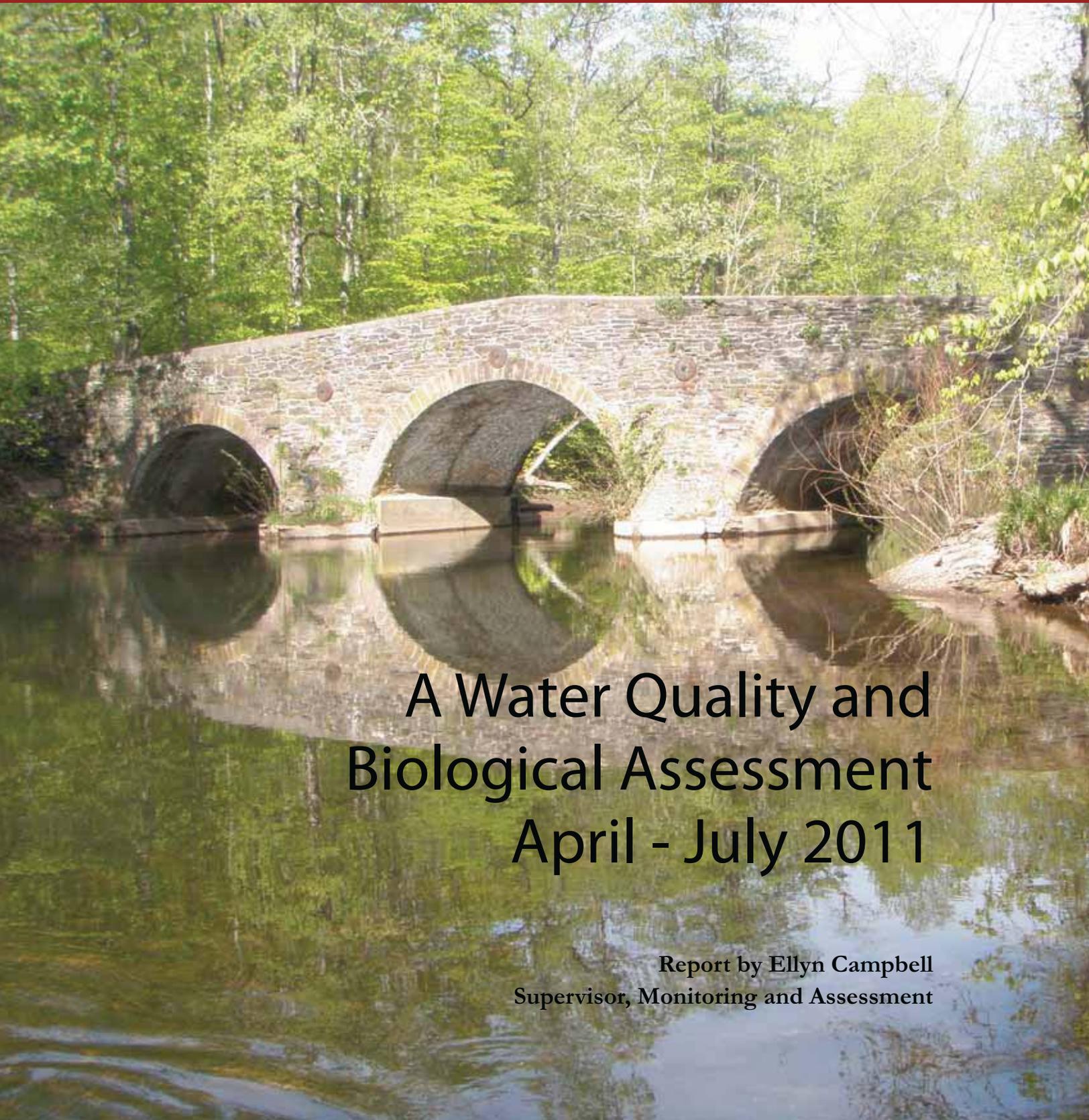


# Lower Susquehanna River Subbasin Year-1 Survey

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## A Water Quality and Biological Assessment April - July 2011

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## INTRODUCTION

The Susquehanna River Basin Commission (SRBC) conducted a survey of the Lower Susquehanna River Subbasin from April through July 2011. This survey was conducted through SRBC's Subbasin Survey Program, which is funded in part through the United States Environmental Protection Agency (USEPA). This program consists of two-year assessments in each of the six major subbasins (Figure 1) on a rotating schedule. The goals of this Year-1 survey were to collect one-time samples of the macroinvertebrate community, habitat, and water quality at 104 sites in the major tributaries and areas of interest throughout the Lower Susquehanna River Subbasin. The Year-2 survey, which is a more focused, in-depth study of a select area, will follow in late 2013 and be focused on the three major reservoirs comprising the last 45 miles of the Susquehanna River—Lake Clarke, Lake Aldred, and Conowingo Pond. Previous surveys of the Lower Susquehanna River Subbasin were conducted in 1985 (McMorran, 1986), 1996 (Traver, 1997), and 2005 (Buda, 2006). A comparison of the 1996 and 2005 data along with the 2011 results is included in this report.

Subbasin survey information is used by SRBC staff and others to:

- evaluate the chemical, biological, and habitat conditions of streams in the basin;
- identify major sources of pollution and lengths of stream impacted;
- identify high quality sections of streams that need to be protected;
- maintain a database that can be used to document changes in stream quality over time;
- review projects affecting water quality in the basin; and
- identify areas for more intensive study.

## DESCRIPTION OF THE LOWER SUSQUEHANNA RIVER SUBBASIN

The Lower Susquehanna River Subbasin is a diverse watershed that drains approximately 5,913 square miles of sandstone ridges, shale/limestone/dolomite valleys, urban areas, and rural landscape from Sunbury, Pa., to where the Susquehanna River empties into the Chesapeake Bay in Havre de Grace, Md. Counties that are located entirely or partially in this subbasin include Adams, Berks, Centre, Chester, Columbia, Cumberland, Dauphin, Franklin, Juniata, Lancaster, Lebanon, Mifflin, Northumberland, Perry, Schuylkill, Snyder, Union, and York in Pennsylvania and Baltimore, Carroll, Cecil, and Harford Counties in Maryland (Figure 2). Four different ecoregions, divided into 11 different subecoregions, are found within this area (Omernik, 1987):



**Figure 1. Six Major Subbasins of the Susquehanna River**

### **Northern Piedmont (Ecoregion 64)**

- 64a: Triassic Lowlands
- 64b: Trap Rock and Conglomerate Uplands
- 64c: Piedmont Uplands
- 64d: Piedmont Limestone/Dolomite Lowlands

### **Blue Ridge (Ecoregion 66)**

- 66b: Northern Sedimentary and Metasedimentary Ridges

### **Ridge and Valley (Ecoregion 67)**

- 67a: Northern Limestone/Dolomite Valleys
- 67b: Northern Shale Valleys
- 67c: Northern Sandstone Ridges
- 67d: Northern Dissected Ridges and Knobs
- 67e: Anthracite Subregion

### **Central Appalachians (Ecoregion 69)**

- 69a: Northern Igneous Ridges

The mixed land use in the Lower Susquehanna Subbasin is connected to the geology of the region (Figures 2 and 3). Ecoregion 66 (Blue Ridge) occurs in the Lower Susquehanna Subbasin and has varying terrain comprised of ridges, hills, and mountains and is mostly forested with freestone streams draining a mix of metamorphic, igneous, and sedimentary rock. Ecoregion 69 (Central Appalachians) is mainly a plateau formation that is predominantly sandstone, shale, conglomerate,

and coal. Since the soils are not conducive to agriculture, this ecoregion is mostly forested. Only very small portions of the subbasin are found in Ecoregions 66 and 69.

Ecoregion 64 (Northern Piedmont) is renowned for agriculture and consequently is dominated by cultivated as well as developed

land. The low hills, irregular plains, and open valleys are comprised of metamorphic, igneous, and sedimentary rocks. Prominent watersheds in Ecoregion 64 include Codorus, Muddy, Octoraro, Pequea, Chiques, Deer, West Conewago, and Swatara Creeks as well as the Conestoga River. The largest urban centers in the Lower Susquehanna River Subbasin—the cities

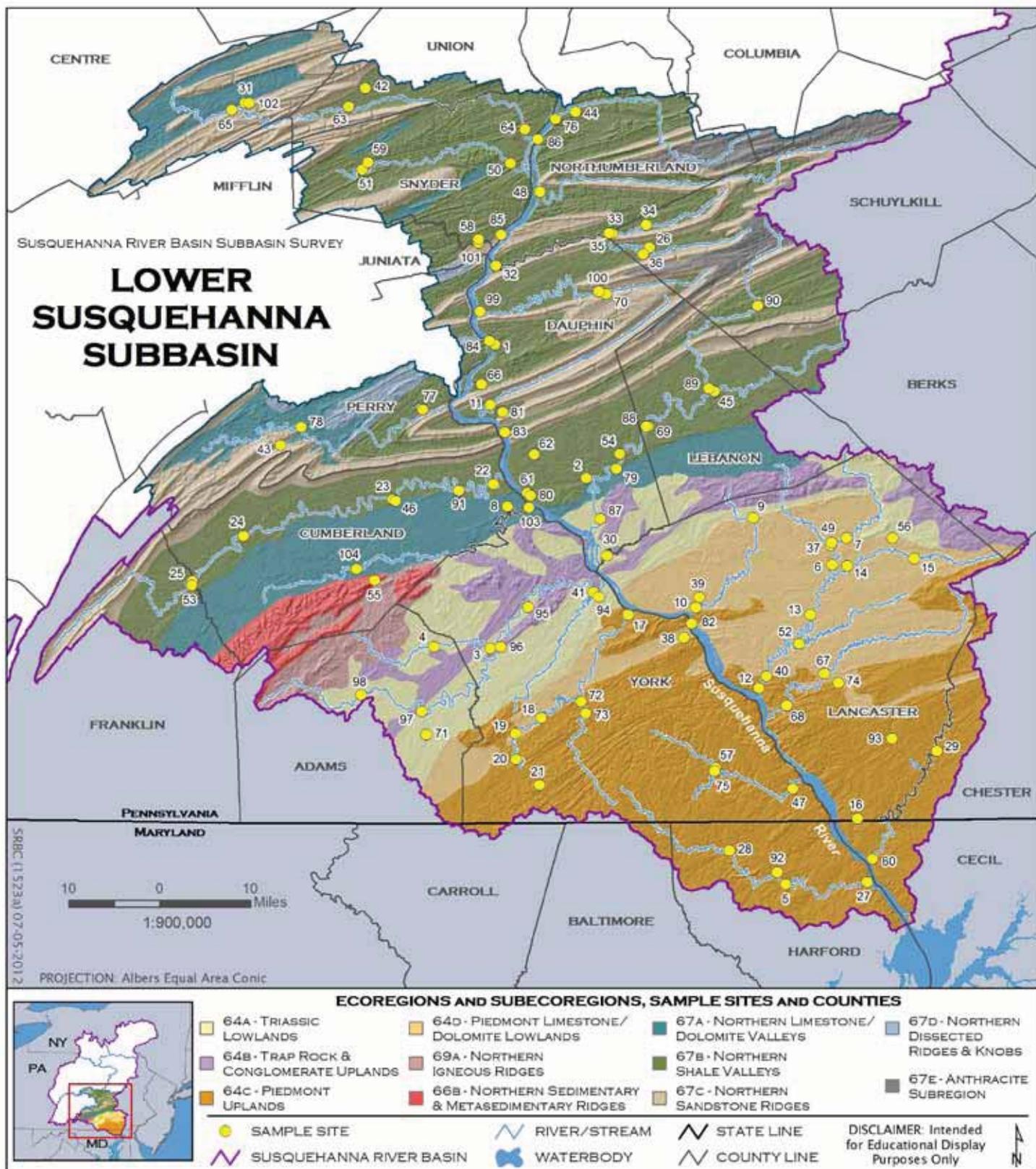
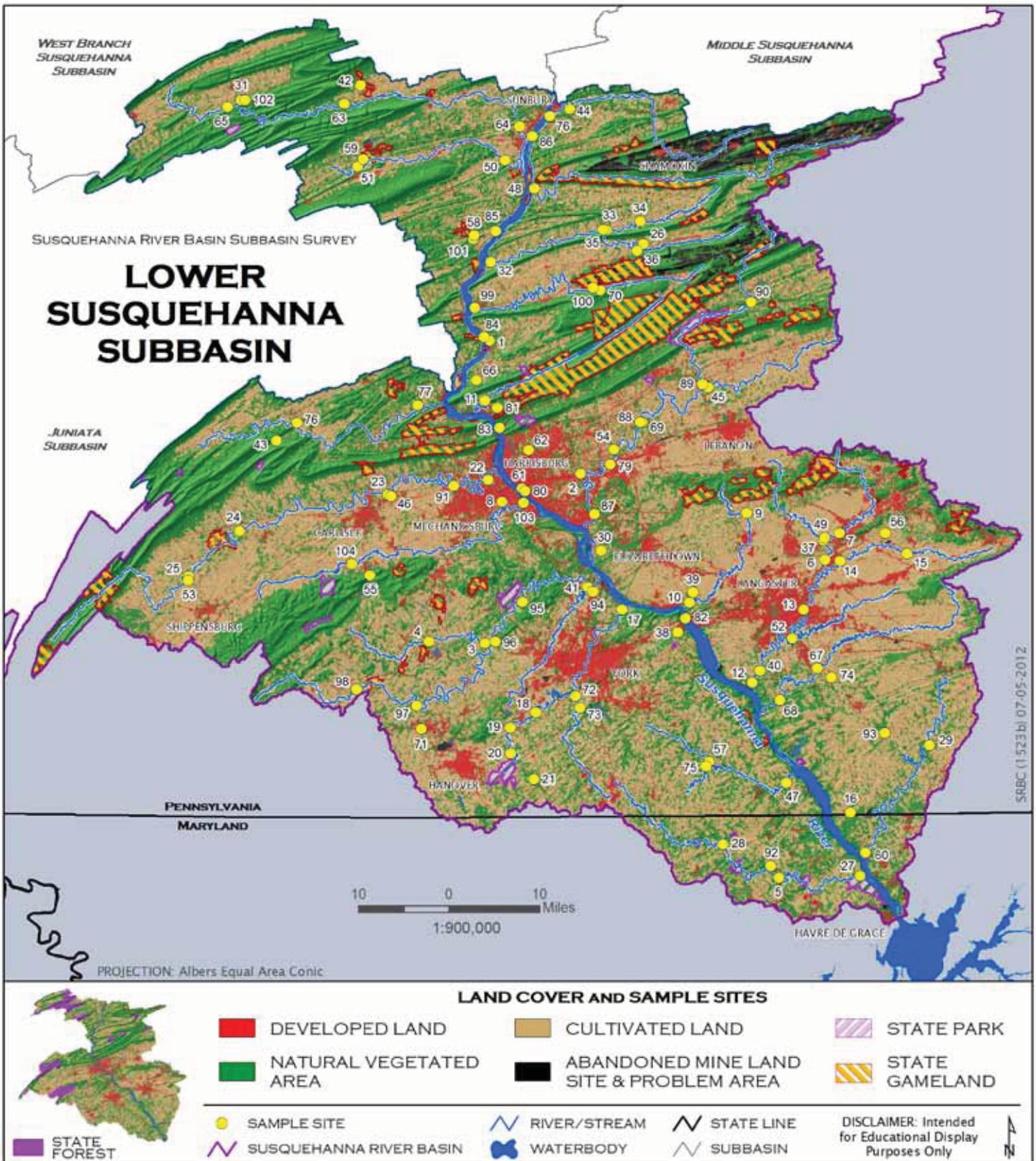


Figure 2. Lower Susquehanna River Subbasin Ecoregions and Sample Sites



**Figure 3. Lower Susquehanna River Subbasin Land Cover and Sample Sites**

of Harrisburg, Lancaster, and York, Pa.—are all located within Ecoregion 64.

Ecoregion 67 (Ridge and Valley) is characterized by nearly parallel ridges and valleys formed by folding and faulting events. The predominant geologic materials include sandstone, shale,

limestone, dolomite, siltstone, chert, mudstone, and marble. Springs and caves are common in this ecoregion. The ridges are mostly forested, and the limestone/dolomite and shale valleys are predominantly agricultural. There is little urban development in this portion of the basin, probably due to the steep, folded nature of the ridges. In the Anthracite Subregion (67e), there