

Description of the Morrison Cove Valley

Morrison Cove is a 186-square-mile valley surrounded on all sides by distinct ridges and located in Bedford and Blair Counties in central Pennsylvania (Figure 1). Morrison Cove is located within Ecoregion 67 - the Central Appalachian Ridges and Valleys, which is characterized by almost parallel ridges and valleys formed by folding and faulting events. The predominant geologic materials include limestone, dolomite, sandstone, shale, and siltstone. Within Ecoregion 67, the Morrison Cove valley is in subcoregion 67a - Northern Limestone/Dolomite Valleys, while the ridges that surround the Cove are in subcoregion 67c - Northern Sandstone Ridges.

The underlying geology of Morrison Cove is folded bedrock that primarily consists of Cambrian and Ordovician age limestone and dolomite. The ridges around the valley consist of sandstones, siltstones, and shale (Figure 2). The limestone and dolomite in the valley are easily weathered, and the elemental compositions of those rock types, calcium and magnesium, often are found in the water. Because carbonate rocks are soluble in water, underground rock is dissolved, leaving channels and conduits that allow for high yielding aquifers. Groundwater in carbonate areas also augments stream flow, which enables relatively stable surface flow even during dry periods.

The Morrison Cove valley contains a number of large subwatersheds: Halter, Yellow, Clover, and Piney Creeks. The Halter Creek Watershed, which includes Plum and Cabbage Creeks, empties into the Frankstown Branch of the Juniata River. Piney and Clover Creeks also flow north, and both empty directly into the Frankstown Branch. Yellow Creek flows south and empties into the Raystown Branch of the Juniata River. Most of the Halter Creek Watershed is contained in the Morrison Cove valley, along with all of Piney and Clover Creeks. The upstream half of Yellow Creek also is included in the Cove.

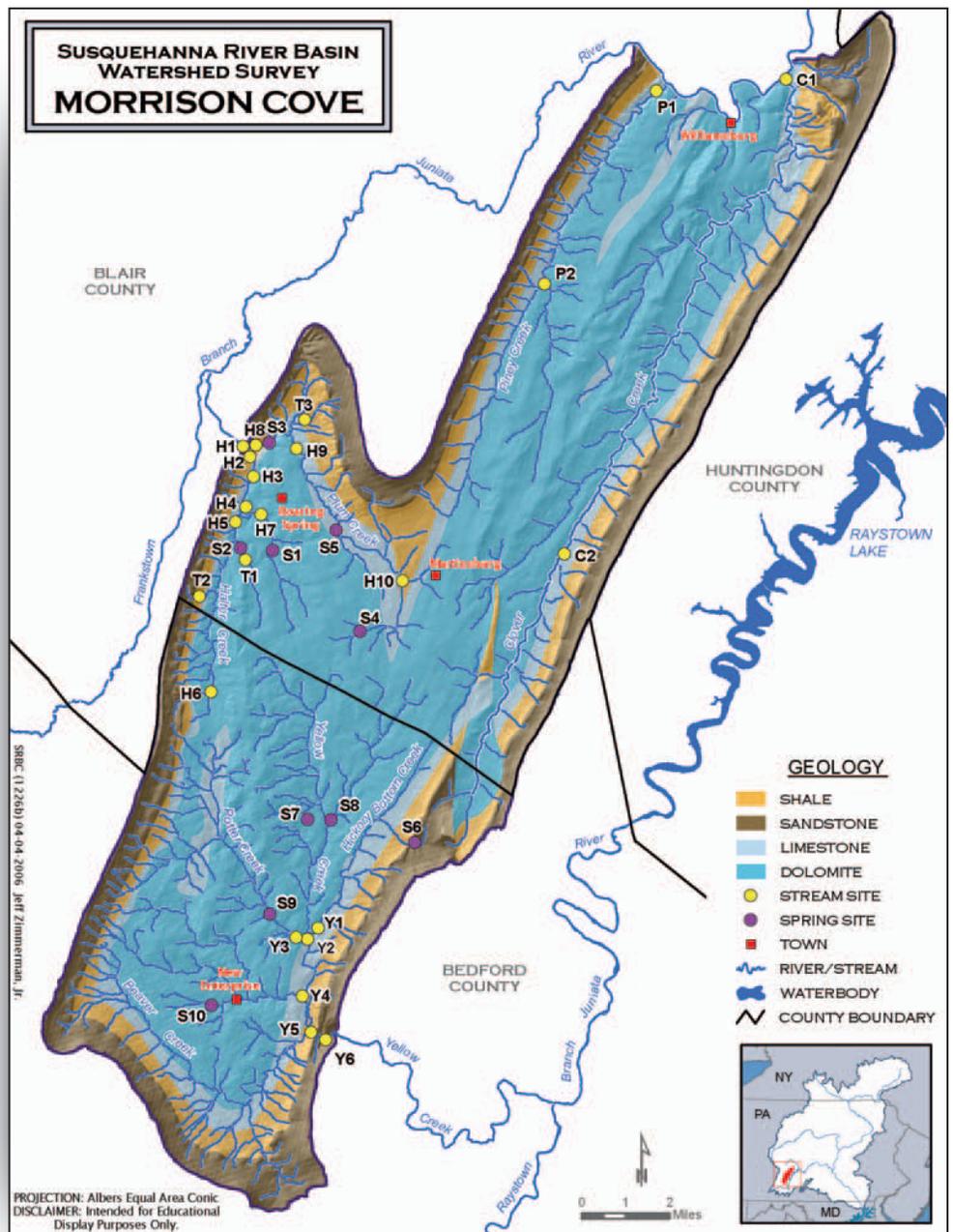


Figure 2. Geology and Sampling Site Locations in Morrison Cove

The largest population centers in Morrison Cove are Roaring Spring, in the downstream reaches of Halter Creek Watershed, and Martinsburg, in the headwaters of Plum Creek. Yellow Creek flows through the small towns of Woodbury and Waterside, and then exits the Cove just east of Loysburg. The dominant land use in the Morrison Cove valley is agriculture, which accounts for about 55 percent of the Cove by area, followed by forested land at approximately 40 percent. Developed areas make up slightly more than one percent of the entire valley. State game lands encompass more than 2,000 acres

in the middle of the Cove, in the headwaters of Potter and Yellow Creeks (Figure 3).

Other Studies

Beginning in early 2000, numerous studies have been done on smaller scales within the Morrison Cove region. The U.S. Geological Survey (USGS) published a report in 2004 on a study completed in the Martinsburg area. The purpose of the USGS study was to define the sources of water and contaminants, specifically nitrates, to the wells that serve as Martinsburg's public water supply. The results showed that animal manure was a possible primary source