

Journals .....	30
Call for Papers .....	31
Events .....	31

# Explore the Chesapeake Bay

**O**ver the next two years, the AAG will host its Annual Meetings in Washington, D.C. and Seattle, Washington, cities along historic, iconic, beautiful, but also polluted estuaries.

These conferences will provide opportunities to explore a multitude of public policy issues associated with cities, rural places, history, and environmental and geographic science, especially of coasts and estuaries.

The first meeting, in April of 2010, around

the time when the cherry trees bloom around D.C.'s tidal basin, the AAG will meet in the world's most powerful city, Washington, D.C., along the banks of the Potomac River and near the heart of the Chesapeake Bay. This region holds appeal for every possible geographic interest, from the economic development of the wealthiest American counties to questions of environmental justice in some of its poorest. But the Chesapeake Bay, the first home of Colonial America, represents a striking incongruity. The great waterway struggles to maintain its water quality, ecosystems, and fisheries in the midst of 17 million people and three major metropolitan areas; yet it is a profoundly beautiful and appealing waterway, where it is common to see ospreys and bald eagles swoop down to snag

*Continued on page 6*



CREDIT: MIKE BAGLEY

*The spectacular Bay Bridge spans more than four miles and connects the rural Eastern Shore of Maryland with the more urban Western Shore and the Washington, D.C. metropolitan region.*

## Call for Papers AAG Annual Meeting

see pages 16-17 inside

fish, and beavers cut down cherry trees. This essay introduces this Bay area through a short history and environmental background to get at the persistent challenges of a large, politically centripetal and diverse population living along an environmentally sensitive waterway.

The Chesapeake Bay is the largest estuary in the United States, covering about 64,000 square miles and including large parts of six states and the District of Columbia. About 150 streams and rivers are part of the Chesapeake, but only three—the Susquehanna, Potomac, and James—account for 80 percent of its area and flow. The Susquehanna, along with its large watershed extending approximately 444 miles southward from Cooperstown, New York, accounts for almost half the Bay's flows.

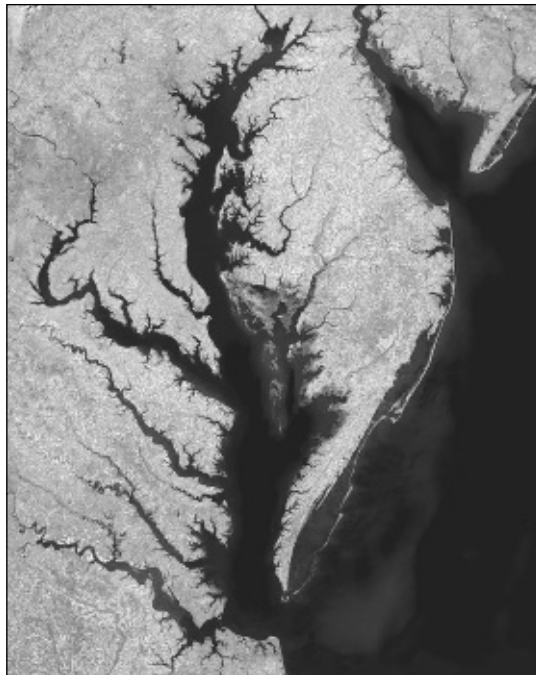
About one-third of the Bay's population lives in the D.C. area, the Nation's ninth largest metropolitan region, which sprawls from Washington, D.C. around the Potomac arm of the Bay. From D.C., the Bay's watershed extends nearly to the Atlantic Beaches, three hours east over the emblematical Bay Bridge. Within this southern third of Megalopolis are numerous National Parks like Jamestown; monuments like Blackwater; seashores like Assateague Island; research centers like SERC (Smithsonian Environmental Research Center); and many trails like the Chesapeake and Ohio Canal, which runs from Washington to Harper's Ferry, West Virginia and points farther west.

## Bay History

In 2007, salvage archaeology at the Freedman's Cemetery near Old Town, Alexandria (Virginia), on a bluff above a stream's confluence with the Potomac, discovered a trace of Ice Age Chesapeake history, a Clovis point. These points are the telltale artifacts of what we used to think were the first Americans, from about 13,000 year ago. But now, several places around the Bay hold tantalizing evidence of Pre-Clovis occupations that challenge the long-reigning orthodoxy of Clovis as the

first culture in the Americas. Some even argue with the controversial Solutrean hypothesis that Pleistocene Europeans were the first inhabitants of the Bay region in the several millennia before Clovis Culture. Wherever they came from, these Pleistocene precedents led to a long, rich pre-history of native populations around the Bay as borne out by numerous archaeological excavations around its waters. One such excavation, actually for the White House swimming pool, found Archaic (9-3,000 BP) stone tools. Humans began more intensive use of the Bay after 3,000 BP in the Woodland Period, with large-scale oyster gathering (seen today in massive oyster middens around the Bay) and the first ceramics and agriculture.

Generally, native groups in the upper Coastal Plain at the time of contact were chiefdoms, such as the Powhatans on the James River and the Piscataway on the Potomac River. The various Algonquian-speaking tribes had recently united in the decade before Europeans entered the Chesapeake.



The Chesapeake Bay is the largest estuary in the United States, covering about 64,000 square miles.

CREDIT: NASA, LANDSAT



CREDIT: LUAN TRAN

Built in 1875, the Thomas Point Lighthouse has become an icon of the Chesapeake Bay.

These hunter, fisher, and gatherer groups were also farmers, growing many crops but always corn, squash, and beans, and of course tobacco. One explorer, William Strachey, counted around 14,000 Powhatans, mostly in riparian sites along the region's shoreline. In his book, *The Historie of Travaile into Virginia Britannia*, he famously wrote of their abundant hunting and fishing grounds in the Bay region.

Jamestown's recent 400th anniversary spotlighted the colonial history of the Bay region, but European presence actually dates closer to 500 years. The first historical encounter was in 1525, when a Spanish expedition from Hispaniola reached the mouth of the Bay. Later, in 1585-1586, English explorers from the Roanoke Colony first transcribed the name as *Chesepiooc*, Algonquian for a village next to a large river. The Bay's early history gained prominence with John Smith's expeditions north into the Bay and what would later become Alexandria, Virginia and Washington, D.C., from 1607-1609. This important early colonial history led Congress to designate the "Captain John Smith Chesapeake National Historic Trail," the nation's first National Historic Trail on water (see [www.nps.gov/cajo](http://www.nps.gov/cajo) for details).

## Physical Geography

Among the more interesting discoveries over the past two decades was that the tip of the Chesapeake Bay, the mouth of the Susquehanna River, contains the largest impact crater in the United States. The bolide

Explore the Chesapeake Bay continued from page 6

impact occurred 35½ million years ago, leaving a crater two times the size of Rhode Island and nearly as deep as the Grand Canyon. Ancestral rivers of the Bay watershed, especially the Susquehanna, formed in association with this crater. These rivers converged over the crater's topographic depressions, which persisted long after the impact, and became an important factor for the Bay's formation.

The Bay ebbed and flowed over the last 2½ million years, forming and reforming the textbook drowned valley on a passive coastal margin. The present Bay is recent, forming only since sea level rose high enough to begin to fill this shallow basin. During the Late Glacial Maximum, the Susquehanna arm of the Bay flowed 100 kilometers farther eastward to a sea level about 130 meters lower than today's. The Bay began to fill with a major pulse of sea-level rise about 8,000 to 7,600 years ago. That rise submerged the ancient Susquehanna River system, the deepest channel of the Bay today.

## Challenges

Despite the Bay's central importance to American history and the millions who use it daily, often what we read about it is negative: declining fish and shellfish stocks and the inability of its many jurisdictions to meet their own clean-up goals. These problems start with the unavoidable nature of the Bay—it is shallow and thus vulnerable to degradation.

Native Americans used fire and possibly over-harvested deer, but like so many bodies of water, the Chesapeake saw its first large-scale human impacts with European settlement and ensuing gluts of erosion that poured into its tributaries. For example, the Lincoln Memorial area of the National Mall was an open shipping channel in colonial times, but sedimentation as well as dredge spoils built this up to the well-drained river bank that it is today. This glut of sediment and its fellow traveling disturbance pollen shows up in cores across the Bay that date as far back as 350 years. But erosion and Bay sedimentation became most severe around the time of the Revolutionary War and later,

as less exhaustively plowed rotation systems gave way to continuous farming, high fertilizer systems.

Until the New Deal and especially the Clean Water Acts took hold in the 20th century, water quality and ecosystems degraded from increasing runoff, raw sewage flows, and the declines of filter-feeding oysters and other species. From this perspective, the "Great Shellfish Bay" has improved since open sewage and unchecked runoff poured into the Bay. But numerous feedlots, urban and other agricultural runoff, and other pollution sources continue to vex the Bay in obvious ways like nutrient loading, a large "Dead Zone" of depleted oxygen, algal blooms, and beach closures due to high bacteria counts. Less obvious pollution has come from so called "endocrine disruptors," derived from personal care items to pesticides. These compounds, which mimic natural hormones, persist through drinking water treatment, and scientists suspect they are related to rampant mutations in aquatic life and pose a threat to human health.

Likewise, most economic and other species, from Bay grasses to shad, continued to experience declines or poor productivity. Only about one-half of the goals for fish and shellfish numbers have been met. The factors contributing to decline include the usual litany of dam building on tributaries, water pollution, air pollution and acid deposition, invasive species, diseases, and over harvesting. Additionally, the Bay has so many political jurisdictions, often with conflicting interests, that making and staying to rules has been a complicated political challenge.

The largest declines have been in the filter feeding oysters, from their legendary highs with oyster beds so thick that navigation was difficult to the present day lows, with authorities contemplating the ecological faux pas of introducing an exotic oyster

in its place. Similarly, the anadromous shad that fed a starving revolutionary army in 1778 and George Washington made so much money on from netting and pickling, has dwindled away to a tiny fraction of its earlier abundance. Equally as disappointing has been the decline of one of the region's most symbolic species—the Blue Crab, whose harvest rose through boom and bust cycles in the 20th century but finally collapsed in the 1990s and has remained low since. Scientific studies also point to a feared decline in the keystone Menhaden, often called the most important fish because it is a filter feeder that helps clean the Bay, and because so many other fish and birds feed on them.

## Reasons for Hope

The return of Rockfish or Striped Bass is one positive exception to trends of decline and one of the reasons for hope for this greatest of American Bays, home to as much as 90% of the Atlantic spawning population. This most prized sport fish suffered steep declines in the 1980s, but rockfish today meets its population goals despite the occasional

instances of illegal trade, as exemplified at a Georgetown fish market in 2008. One clear reason for its success has been tight control of the fishery, including moratoria on seasons in 1985 through 1989. Rockfish and other fish may also prosper because of the trend toward dam removal, an example of which is the elimination of the Embrey Dam on the Rappahannock River in 2004.

Another reason for hope is the resurgence of public interest in the Bay by people of all ages. This resurgence is driven by numerous actors, from the Bay's many conservation organizations, to a vast body of scientific studies, to the tireless work performed by educators at all levels. Exemplified by President Obama's Executive Order in May 2009 (directing the Federal

Continued on page 8



CREDIT: GREG CARTER

The blue heron, with an average wingspan of more than six feet, is a common sight on the Chesapeake Bay.

*Explore the Chesapeake Bay continued from page 7*

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Government to lead the effort to clean this national waterway), this resurgence has gotten through to the highest levels. This renewed federal oversight promises to deal with the long-standing political problem of multiple jurisdictions and promote the well-recognized factors for bringing back the Bay: moratoria on some fisheries, curtailing runoff, removal of more unneeded dams, restoring degraded wetlands, controlling invasive species, and the constant drumbeat

of inspired education at all levels. Thus, we may hope that the pieces are in place to "turn the tide" for this "National Treasure."

The 2010 AAG Annual Meeting in Washington will be a great opportunity for geographers and others to organize field trips and excursions exploring the Chesapeake Bay, and paper and panel sessions around all the issues that consideration of the Bay brings to the fore: wetland biogeography, river and estuarine geomorphology,

urban and rural historical geography, environmental justice, geographic education, GIS of land use change over time, water treatment and management, and, of course, the role that government programs and policies play at all levels, from town councils to Supreme Court decisions. ■

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