

NATURE'S

Grapevine

WASHINGTON CROSSING STATE PARK, NJ

Winter 2012

Glaciers - Now and Then

by
Joyce Watson

Glaciers are splendid displays of the power and beauty of nature. Humans have been living with glaciers for thousands of years and scientists have identified more than 67,000 glaciers in our modern world. Glaciers have become major scenic attractions and a welcome thrill for hikers and ice climbers.



Glaciers are created by the accumulation of snow. When the temperatures are frigid, the snow piles up and the weight of the snow compresses and freezes to create solid ice. First the pressure turns the snow to ice granules, called firn. Then the continued pressure causes the firn to turn to solid glacial ice. During warmer weather, melting snow on the surface of a glacier channels downward, where colder internal temperatures refreeze it. Some glaciers remain liquid at the bottom, forming lubrication that helps the glacier to slide over surfaces. Gravity causes the entire icy mass to move downward following the slope of the land.

Glaciers that lose more ice than they add are said to be shrinking or receding. Glaciers in the Alps are estimated to have shrunk by 30% since the mid-1800's. Glaciers in the Himalayas are believed by some to be shrinking. Glaciers on the Antarctic Peninsula appear to be receding as are glaciers on Mt. Kilimanjaro.

Glaciers that add more ice than they lose are said to

be growing or expanding. Alaska's Hubbard Glacier, one of the largest glaciers in the world, is currently expanding, advancing into the Situk River. It has been creeping forward since the 1890's. In 1986 however, its speed increased significantly. A massive ice dam was created on the local fjord creating a lake about 100 square miles in size before it was breached by the water in the Situk River. When a large mass of ice breaks off Hubbard Glacier, the sound can be heard for miles. And the sight of it calving (the birth of icebergs) is spectacular. Other expanding glaciers are found in Iceland and Antarctica.

Several different types of glaciers exist. Tidewater glaciers, which are found mostly on the coast, are the most exciting to watch. Calving ice is their most distinct feature and it separates them from the other glacier types. Tidewater glaciers create icebergs that can range in color from deep blue to dark green. Alpine glaciers are found high on the mountain slopes of plateaus and appear as small circular glaciers or hang-icefalls which flow like waterfalls. Valley glaciers are created when alpine glaciers flow downhill and accumulate on a valley floor. The ice flow of these glaciers is similar to water flowing in a river. Piedmont glaciers are created by at least two glaciers that merge to create a large fan-shaped shelf of ice. Special features of a Piedmont glacier are medial moraines (rocks and dirt) that appear as distinct black lines down the center of the glacier.

Continental glaciers are ice sheets that move outward in all directions. This type of movement can be compared to the movement of pancake batter poured onto a griddle. The batter moves outward in all directions from the thickest mass in the middle. The only continental glaciers today are in Greenland and Antarctica. However, there were more during the Pleistocene Epoch of earth's history.



Continental glaciers, thousands of feet in depth, have visited northern New Jersey and northern Pennsylvania three times during the Pleistocene Epoch (the era of woolly mammoths, saber-toothed cats and small three-toed horses). A large amount of the earth's surface water was locked up as glacial ice during the last several ice ages and the oceans decreased in volume. As a consequence, the Atlantic shoreline extended out to the edge of the continental shelf and was located as far as 60 miles east of its present location in New Jersey. The receding of the last glacier that visited North America created the Great Lakes as well as Lake Hopatcong, the Great Swamp and many of the lakes in northern New Jersey and northern Pennsylvania.

The first glacial visit was about 800,000 years ago (called pre-Illinoian glaciation). The second visit (called Illinoian) happened about 150,000 years ago. The effects of these visits are hard to perceive because the last visiting ice sheet, the Wisconsinian glacier, destroyed much of the evidence of the previous ice ages.

In northern New Jersey the Wisconsinian glacier was thick enough to flow over the Kittatinny and Watchung Mountains. It advanced in small lobes that followed the Hudson, Passaic, Hackensack, Kittatinny and Delaware Valleys. The furthest reach in New Jersey is marked by the Terminal Moraine, a low ridge of unconsolidated rocks and debris that extends from Belvidere through Morristown down to Perth Amboy. Glacial erratics, rocks transported by glaciers miles from their original homes, indicate the flow of the ice sheet. Glacial erratics are found throughout northern New Jersey.

The Wisconsinian glaciation reached into Lycoming, Sullivan, Luzerne, and Monroe Counties in Pennsylvania. Valleys that were parallel with the direction of the ice flow eroded deeper. In some places the deposits are 200 feet thick as in the Delaware River Valley between Matamoras (at the eastern tip of Pike County) and The Delaware Water Gap (in Southeast Monroe County). The valleys that were transverse (lying crosswise) to the direction of the ice flow, have thin glacial deposits and exposed bedrock streambeds like Towanda Creek Valley in Bedford County and Lackawaxen Creek Valley in Pike County. The end moraine in Pennsylvania is east of the Lehigh River in the Pocono Plateau.



Want to visit glacier-related sites in Pennsylvania and New Jersey? Moraine State Park in Portersville, Pennsylvania has a Glacial Ridge Hiking Trail. Archbald Pothole State Park, located nine miles north of Scranton in Dalton, Pennsylvania, is named for its geological feature formed during the Wisconsinian glacier. The pothole is 38 feet deep and has an elliptical shape. They say it would take 38 fire trucks to fill the hole. The Delaware Water Gap, in both Pennsylvania and New Jersey, has many overlooks where you can see glacial erratic and till deposits. In New Jersey you will also see glacier remains in High Point State Park located in the northwest Skylands.

Glaciers and ice ages have greatly modified the landscapes of Northern New Jersey and Pennsylvania. The scouring action of millions of tons of glacial ice have carved out valleys and lowlands and exposed bedrock in numerous locations. Glacial melt waters or outwash has affected areas even far to the south of the edge of the former ice sheets, and interesting moraines, glacial lakes and ponds, and glacial erratics dot the region and are available for anyone to behold.

Joyce Watson contributes frequently to Nature's Grapevine. She owns a bookstore, INDIAN PATH BOOKS, located in Chester County, Pennsylvania. The store, which buys, sells and trades used books, is on Rt 23 (514 Ridge Rd.) 15 miles west of Valley Forge Park. Open daily. Phone 610-495-3001.

Volunteer Notes

Bill Schindler, Shrewsbury and his son **Dr. Bill Schindler**, Church Hill, MD, along with a multitude of volunteers, put together our annual Primitive Technologies Day/knap-in Weekend in October. Hundreds of visitors enjoyed the day.

Dr. David Letcher, Ewing, and **Gene Ramsey**, Pennington collaborated on behalf of the **Amateur Astronomers Association of Princeton** to bring four sessions of astronomy instruction to the Nature Center in September and October.

Dr. Ken Kremer, Lawrenceville, came in to give a presentation on the last flight of the space shuttle and NASA's future plans for space exploration.

Nettie Rekowski and **Ellen Coleman** Both of Ewing staffed the Nature Center during programs.

John Ecks, Washington Crossing, and **Blue** (John's black lab) removed windfall blocking one of our trail bridges.

Ben and **Jean Strauss**, Titusville, **Al Fitipaldi**, Titusville, **Priscilla Damiani**, Ewing, and **Ellen Coleman**, Ewing, all assisted preparing our wreath-making program.



Around the Park

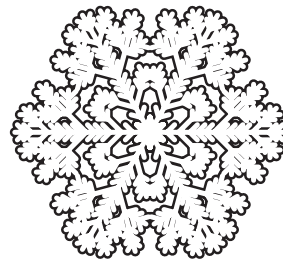
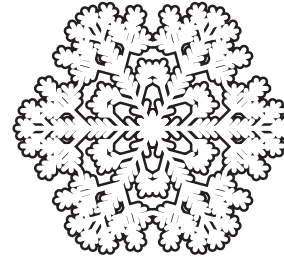
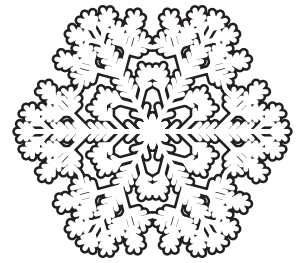
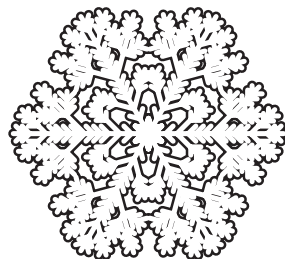
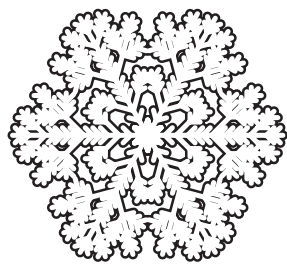
Primitive Technologies Day on Columbus Day Weekend was a resounding success. The weather was beautiful and hundreds of park visitors enjoyed demonstrations in a variety of prehistoric technologies and skills.

Numerous trees came down around the park as a result of an unusual late October snowstorm.

Groups from Pemberton, Lawrenceville, Princeton, Hopewell Twp., Wall Twp., Pennington, and Titusville visited the Nature Center this past autumn for a variety of interpretive programs including trail hikes, shelter building, forestry, compass basics, geocaching and Lenape lore. We are currently programming for the winter and spring. Interested teachers, homeschoolers and scout leaders should give us a call.



Shelter Building is one of the more popular programs offered at the WCSP Nature Center.



This newsletter is available free of charge electronically . It can be downloaded at the web address below. Requests to be included on the emailing list may be made by contacting the Nature Center.



Nature CENTER

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Titusville, New Jersey 08560-1617



- Phone**.....(609) 737-0609
- Fax**.....(609) 737-0627
- Email**.....wcpscsr@comcast.net
- Hours**..... Wed - Sat 9:00 a.m. - 4:00 p.m.
Sun 12:00 p.m. - 4:00 p.m.
Closed Mon and Tues
- Website**.....www.state.nj.us/dep/parksandforests/parks/washcros.html

**Park Naturalist
& Newsletter Editor**.....Wayne Henderek

Winter Programs at the Nature Center

The following is a list of activities being offered through the Nature Center at Washington Crossing State Park in Titusville, New Jersey. All programs are offered free of charge. Some will require advanced registration as indicated below. Attendance is always limited and is available on a first-come, first-served basis. Programs will commence at the Nature Center unless otherwise indicated. An adult must accompany all children. In the event of inclement weather some programs might be canceled. It is always advisable to call ahead before coming out. These events are intended for families and individuals only. Programs for scouts, schools and other groups are scheduled separately by special arrangement.

Phone : (609) 737-0609

BLUE DOT TRAIL "FIRST DAY" HIKE (9yrs. –adult) Sunday January 1, 1:30 - 3:30 p.m. This will be a naturalist-guided winter hike of approximately 2.5 miles, through the heart of Washington Crossing State Park. **First Day Hikes** are a nationwide effort promoting outdoor events on New Years Day. Wear sturdy footgear and bring drinking water.

NATURE/HISTORY VIDEO Saturday January 7, 12:45 p.m. *The Civilian Conservation Corps*. This PBS presentation chronicles the history of the CCC program in which workers fought fires, built roads, bridges, trails and worked on a variety of conservation projects in the nation's parks and forests during the Great Depression era.

NATURE VIDEO Saturday January 14, 12:45 p.m. *Along the Delaware*. This video takes the viewer on a trip down the length of the Delaware River from its source near Narrowsburg, NY to its mouth at Cape May and presents the various fish, shellfish and other resources that can be harvested along the way.

NATURE/VIDEO Saturday January 21 12:45 p.m. *Living with New Jersey Black Bears* This intriguing video provides an inside look at one of the state's most interesting wildlife species and gives some clues on how to safely share the landscape with these animals.

BALDPATE MOUNTAIN HIKE (pre-teen – adult) Sunday January 22, 1:30 – 4:00 p.m. We will take the red trail from its trailhead on Church Rd. to the top of the hill. Meet at the parking lot by Niederer's Pond (Church Rd). Advanced registration required. Bring a water bottle and wear hiking shoes.

NATURE VIDEOS Saturday January 28, 12:45 p.m. *Turning the Tide*. This half-hour documentary showcases the hidden beauty of the tidal areas in and around the Hackensack Meadowlands of northern New Jersey and the Hamilton-Trenton Marsh just south of the state capital of Trenton. *The Highlands Rediscovered* focuses on the rich natural history and the water resources in northern New Jersey.

NATURE VIDEO Saturday February 4, 12:45 p.m. *From Poles to Tropics* . The Earth as a whole is considered with a view towards the main factors that have manipulated the planet's natural history.

GEOCACHE WASHINGTON CROSSING STATE PARK (preteen – adult) Sunday February 5, 1:30 – 3:30 p.m. Geocaching is a high-tech update on the good old-fashioned scavenger hunt game utilizing GPS (global positioning System) technology to locate objects hidden among the forests, fields and trails of parks, playgrounds, natural areas and other open lands. Participants will learn how to obtain information and hints from the Geocaching.com website, on the location of over a dozen geocache sites located in and around the state park. They will then use handheld GPS devices to go out and find as many caches as possible. Once a cache is found, participants typically will sign in on the log contained within and then take an object from the cache box after leaving a trinket for subsequent geocachers. Participants should bring a pocket full of trinkets to exchange when they locate caches. Trinkets can include small toys and balls, plastic jewelry, pens, pencils, scratch pads, patches, action figures, coins, etc. Advanced registration required after 1/10. A limited number of GPS navigation devices will be made available to participants. Bring your own handheld GPS device if you have one.

(more Nature Center events, next page)

(Nature Center events continued)

NEW JERSEY PALEO ARCHAEOLOGICAL SITES, TOOL MAKING INDUSTRIES AND ICE AGE LIFEWAYS Saturday February 11, 12:00 – 4:00 p.m. (pre-teen - adult) **Jack Cresson**, Archaeologist, and **Jim Silk**, Lithic Technologist will take participants on a journey back in time when the earliest Native American people entered into what is now New Jersey. The program will examine regional Paleo archaeological sites, aboriginal human lifestyles, arctic landscapes and unusual prehistoric animals. Also, this program will demonstrate and explain the manufacture of specialized stone tools that were used by indigenous Ice Age people in adapting to their harsh environment 10,000 to 13,500 years ago. Paleo artifacts and tool replications will be displayed.

NATURE VIDEOS Saturday February 18, 12:45 p.m. *The Poles*. The advance and retreat of polar ice is the real challenge to life. In Antarctica all animals flee except the emperor penguin. Meanwhile, in the Arctic, the polar bear must swim long distances to obtain food. Learn how wildlife survives in some of the most challenging places on the planet.

NATURE VIDEO Saturday February 25, 12:45 p.m. *Forests*. From the evergreen forests of the frozen North to the deciduous dry forests of the tropics, these woodlands illustrate the intense seasonality of the Earth. As the tallest, largest and oldest organisms on the planet, trees are home to a fascinating range of wildlife.

MAPLE SUGARING (All Ages) Sunday February 26, 1:30 – 3:00 p.m. This event is a participatory demonstration in the procedures of home maple sugar production. Advanced registration required after 1/24.

MAPLE SUGARING (All Ages) Saturday March 3, 1:00 - 2:30 p.m. This event is a participatory demonstration in the procedures of home maple sugar production. Advanced registration required after 1/31.

MAPLE SUGARING (All Ages) Saturday March 10, 1:00 – 2:30 p.m. This event is a participatory demonstration in the procedures of home maple sugar production. Advanced registration required after 2/7.

MAPLE SUGARING (All Ages) Sunday March 11, 1:30 – 3:00 p.m. This event is a participatory demonstration in the procedures of home maple sugar production. Advanced registration required after 2/16.

WINTER BIRDS OF THE PARK (All Ages) Sunday March 18, 1:30 - 3:30 p.m. Come join veteran birder Lou Beck of Washington Crossing Audubon as we walk the trails in search of a variety of winter bird species and perhaps some early spring migrants. Advanced registration required after 2/21.

EARLY SPRING TWILIGHT HIKE (Adult) Thursday March 29, 7:15 p.m. We will search the park's remote northern sections for early spring twilight and nocturnal phenomena such as woodcocks in courtship, spring peepers and other breeding amphibians, owls, etc. Advanced registration required, Meet at the parking lot by Niederer's Pond (Church Rd). Wear boots and bring a flashlight. Advanced registration required after 2/28.

Winter Programs
at the
Visitor Center Museum
(609) 737-9303

HISTORY VIDEO Saturday, January 7, 2:00 p.m. *The Battle of Moore's Creek*. This 13-minute video interprets one of the earliest and important battles in North Carolina, February 27, 1776.

HISTORY VIDEO Saturday, January 14, 2:00 p.m. *King's Mountain, NMP*. This 20-minute video interprets the American victory on October 7, 1780 against Patrick Ferguson's Loyalists.

(more Visitor Center events, next page)

(Visitor Center events continued)

HISTORY VIDEO Saturday, January 21, 2:00 p.m. *Daybreak at the Cowpens*. This 20-minute video interprets the important American Victory at Cowpens, South Carolina on January 17, 1781.

HISTORY VIDEO Saturday, January 28, 2:00 p.m. *Another Such Victory: The Battle of Guilford Courthouse*. This 30-minute video recreates a costly British victory in North Carolina on March 15, 1781.

HISTORY VIDEO Saturday, February 4, 2:00 p.m. *Liberty! The American Revolution: The Reluctant Revolutionaries*. Part I. This 120-minute video covers the time period leading up to the American Revolution and its causes and concludes with the signing of the Declaration of Independence.

HISTORY VIDEO Saturday, February 11, 2:00 p.m. *Liberty! The American Revolution: The Times That Try Men's Souls*. Part II. This 120-minute video covers the dark days of 1776, including the Christmas night crossing of the Delaware River and the victory at Saratoga that would finally bring France into the war.

HISTORY VIDEO Saturday, February 18, 2:00 p.m. *Liberty! The American Revolution: Are we to be a Nation?* Part III. This 120-minute video discusses the shift of the war into the south and the important victory at Yorktown as well as the creation of the Constitution and the Bill of Rights.

Winter Programs at the Johnson Ferry House (609) 737-2515

WINTER FOODWAYS HEARTH COOKING CLASS Saturday January 14, 10:00 a.m. - 4:00 p.m. **Mercy Ingraham** will teach this class using period recipes and techniques. Advanced registration required: call or email jfhwashxing@fast.net. Class size is limited to 12 persons.

CHOCOLATE WORKSHOP Saturday February 4, 10:00 a.m. - 3:00 p.m. **Susan McLellan Plaisted** will teach this class, beginning with bean roasting. Class size is limited. Advanced registration required. Please call 215-219-9542 or email foodhxs@aol.com.

GEORGE WASHINGTON'S BIRTHDAY CELEBRATION Sunday February 19, 2012 1:00 p.m. - 4:00 p.m. Colonial music, toys and games, the history of gingerbread, and other ongoing activities. Refreshments available. Great family event. Please call for more information.



New Jersey Department of Environmental Protection