

project WWEB

Spring
2012

Connecting Projects WILD, WET and Learning Tree in New Hampshire

Exploring Nature Through a Social Science Lens

Often with this newsletter, we look at nature scientifically. In this issue, we use a different lens to explore the world around us. While the stories were written by people who are considered “scientists” – data collectors and policy makers by trade – each article illustrates a way of looking at nature from a human perspective.

Humankind’s connections to the Earth are unmistakable. We revere nature for its beauty. We enjoy

our time recreating in its diversity. We rely on the resources of the planet to support our existence. We fear nature’s wrath during extreme weather.

The wonderful thing about studying nature is that the lines of the “subject areas” become blurred. A science lesson can quickly become a lesson in history, civics or geography. We hope this issue will provide you with ideas for integrating social sciences into your scientific topics.



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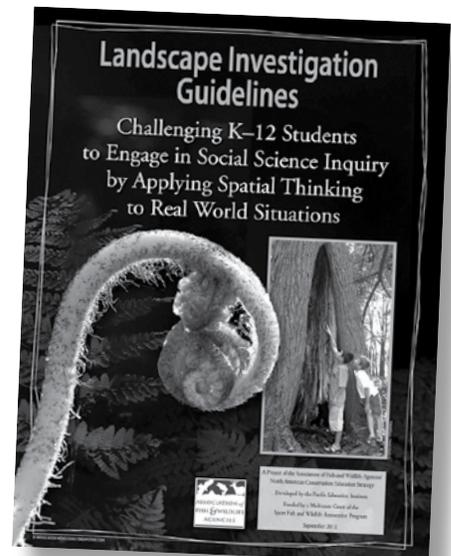
Creative Real-world Learning Using Social Science Inquiry

By Judy Silverberg, N.H. Fish and Game Wildlife Programs Supervisor

At the heart of social science inquiry is curiosity about the place in which we live. Landscape investigation creates opportunities for students to gain problem-solving skills and promotes creative real-world learning by providing a framework for exploring questions about sustainability and the quality of life.

Understanding spatial organization on the surface of the earth is at the heart of landscape investigation, but the bigger question is, “How do teachers and students adopt this approach so that they truly grasp the process of investigating the human-built landscape?” The answer is to draw on the other social science disciplines, those that have an ongoing and meaningful connection to geography. By incorporating the perspectives of these other disciplines, students and teacher will be able to “SEEH” and understand the spatial organization of the area they investigate.

The “S” in SEEH stands for “spatial,” the application that geographers use to orient themselves



– how they see the world. The first “E” stands for “ecological,” the playing field upon which students and teachers observe the interactions, modifications

LANDSCAPE GUIDELINES continued on page 2

It is not what we have that will make us a great nation; it is the way in which we use it.

~ Theodore Roosevelt



Working to Protect the Suncook River

by Vanessa Goold, Principal Planner,
Central NH Regional Planning
Commission

The Suncook River may soon be designated as a protected river corridor. A committee has been formed to sponsor the river's nomination, coordinated by the Central N.H. Regional Planning Commission and the Lakes Region Planning Commission.

The state of New Hampshire established the Rivers Management and Protection Program in 1988. Administered by the Department of Environmental Services (DES), the program provides a two-tiered approach to river management and protection: State designation of significant rivers and protection of instream characteristics, and local development and adoption of river corridor management plans to protect shorelines and adjacent lands.

Sponsors submit a nomination document that includes an inventory and assessment of the river's values, characteristics and significant resources. The Commissioner of DES and the state Rivers Management Advisory Committee evaluate nominations. If approved, the nomination is forwarded to the State Legislature, where a bill is considered to formally designate the river. Once designated, the river and a quarter-mile wide buffer on either side become a protected river corridor.

Why the Suncook?

The Suncook River Community Planning Team, formed in 2010 with town officials and emergency management personnel in the five lower Suncook communities, has been working together to promote regional hazard mitigation and resource planning along the Suncook River. This group identified a need for continued regional communication and cooperation on a variety of matters relating to the river.

The Suncook River is a dynamic system with many resources vital to local communities. Historically, the river has shaped patterns of settlement in the area. Several hydroelectric dams operate along the Suncook, and the towns of Epsom, Pembroke and Allenstown all depend upon aquifers adjacent to the river for public water supplies. The river is used recreationally by paddlers, anglers, hikers and wildlife watchers. It also provides a habitat corridor for wildlife. The Suncook River represents

an important regional resource whose water quality, quantity and flow directly affect residents and users throughout the region. Designation would provide statewide recognition and opportunities for regional river management.

Cooperation in the River Corridor

One of the most significant benefits of designation is the opportunity for the towns along the Suncook River to collaborate on planning and management of the river. All seven riverfront towns – Gilmanton, Barnstead, Pittsfield, Chichester, Epsom, Pembroke and Allenstown – are participating in the nomination process.

If the river is designated, a Local Advisory Committee will be established to represent various interests in the river corridor. Its job is to develop and implement a river corridor management plan and to provide comments on DES permits issued within the river corridor. It functions as a sort of "super conservation commission" for the river, advising other local land use boards on potential impacts to the river, as well as



The Suncook River passes thorough several New Hampshire towns, including Pittsfield.

PHOTO © MARK WALLACE

conducting outreach and public education. Leaders from each town along the river will work together to address the river and watershed as a system, rather than handling issues on a town-by-town basis. River-wide planning makes more sense ecologically and should offer a more effective set of management tools to address river issues.



Correlations to N.H. Social Studies Framework: Civics and Governments (CV:2), Structure and Function of United States and New Hampshire Government; and (CV:4), Rights and Responsibilities.

LANDSCAPE GUIDELINES *continued from page 1*

and the alterations that occur between humans and the environment. The second "E" stands for "economic." Most decisions that impact the landscape were economically motivated and have various economic ramifications that are important to our understanding of our dynamic world. Lastly, the "H" stands for "historical," the agent that creates our overall perception of the importance of space and place and explains the forces that have shaped our present.

This approach brings together the overarching idea of spatial organization to address considerations such as ecological change, economic decisions that leave an imprint on the landscape and the relevance of long-lasting effects of past events. By observing the spatial interplay in an ecological, economic and historical way, students come to ask questions related to the ongoing

interactions of these social and natural systems.

This leads students to reason through the complex issues of our society and to develop a much deeper understanding of the world. From that informed and thoughtful position, students can then take action on the issues that are at the core of local, regional, national and international communities.



Excerpted from Landscape Investigation Guidelines, a project of the Association of Fish and Wildlife Agencies' North American Conservation Education Strategy, developed by the Pacific Education Institute. The 60-page manual is available for free download at www.fishwildlife.org/files/ConEd-Landscape-Investigation-Guidelines.pdf

Spotlight on...

Focus on Forests

Project Learning Tree launches a new guide for secondary teachers

By Erin Hollingsworth
NHPLT Education Director

Do students know that the water from their faucet might be naturally filtered by a forest instead of a water treatment plant? Are they aware they can calculate the carbon sequestered by the trees in their own backyard? These thought-provoking questions are examples of some of the topics explored in a new Project Learning Tree® (PLT) environmental education curriculum resource for middle and high school teachers.

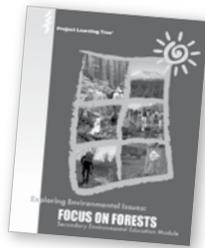
The new *Exploring Environmental Issues: Focus on Forests* module is designed to foster student understanding of and appreciation for the forested lands throughout North America. The module's activities provide an opportunity to address a multitude of subject areas, including STEM (science, technology, engineering, and math), civics and social studies. A "knowledge primer," ready-to-use student worksheets, and hands-on classroom lessons and field investigations help students explore stewardship and informed decision-making on issues that affect forests. PLT uses experiential learning, inquiry-based investigations, outdoor

education and service-learning to help educators make the lessons relevant and fun for students.

N.H. Project Learning Tree and its partners, the Hubbard Brook Research Foundation, the U.S. Forest Service and the White Mountain National Forest, are providing an opportunity for teachers to get the new *Focus on Forests* module along with other secondary modules from PLT, such as *Places We Live* and *Forests of the World*, as part of a year-long professional development program for middle and high school teachers called *Forest For Every Classroom (FFEC)*.

This program is aimed at providing the inspiration, knowledge and skills required to transform classroom teaching into effective and exciting place-based education. Teachers develop or modify their own units to increase student literacy skills and foster student understanding of the forested lands in their own communities. Social studies connections such as civics, geography, economics and human influences on natural environments all play a role.

At the heart of FFEC is the belief that students who are immersed in the study of their own "place" are more eager to learn



about and be involved in the stewardship of their communities and public lands. Place-based education is the process of using the local community and environment as a starting point to teach concepts in science, mathematics, social studies and other subjects across the curriculum. This approach is proven to increase academic achievement, while helping students develop stronger ties to their community, build appreciation for the natural world and encourage commitment to becoming active citizens.

For more information about getting the PLT secondary module, go to www.nhplt.org/programs/a_forest_for_every_classroom. The next session begins on May 11, 2012. Register by April 10 at www.nhplt.org



N.H. high school teachers develop skills to use in their classrooms through field investigations as part of Forest For Every Classroom.

Good Forestry in the Granite State

by Karen P. Bennett, Extension Forestry Professor and Specialist, UNH Cooperative Extension

Chances are, the forests you see as you walk or drive along New Hampshire's roads are owned by your neighbors – not by town, state or federal government. New Hampshire is 83% forested, and about three-quarters of that land is owned by approximately 100,000 people. That means private landowners bear a large responsibility. They are the stewards of our clean water, beautiful scenery, abundant wildlife, fresh air, natural and cultural heritage, not to mention the basis of our forest industry and much of our recreation – and they pay taxes for the privilege of supplying these benefits to the rest of us. Individual actions by these

landowners contribute to the sustainability of the state's forest, one woodlot at a time.

Good Forestry in the Granite State: Recommended Voluntary Forest Management Practices for New Hampshire was first published in 1997. *Good Forestry* is an important tool to help landowners protect our forests. The book was recently revised through a two-year process involving extensive public participation to incorporate advances in knowledge and changes in forestry markets, practices and state laws.

You don't need to be a landowner to use *Good Forestry*. It is an educational tool with information about most aspects of New Hampshire's forest, including New Hampshire forest types, silviculture (the art and science of growing trees),

vernal pools, riparian forests (forests along rivers), wildlife habitat, forest products, invasive species, forest health, maple sugaring and ecosystem services markets.

Good Forestry is a 225-page guide in a three-ring binder format; it can be ordered online, or call 800-444-8978; each copy comes with a CD. An online version is available for free at www.goodforestry.org.



Correlations to N.H. Social Studies Framework: Geography (GE:2), Places and Regions; (GE:3), Physical Systems; and (GE:5), Environment and Society.

Karen Bennett was the project manager for Good Forestry. She has worked for UNH Cooperative Extension since 1979 and has been the Forestry Specialist since 1996.

Irene Is Long Gone, But Cleanup Continues

by Tiffany Benna, Public Affairs,
White Mountain National Forest

On August 28, 2011, the White Mountain National Forest braced itself for the hurricane winds of Tropical Storm Irene – but it was the water that came with a vengeance. The storm brought torrential rains in some areas; within just a few hours, up to 10 inches of rain fell across the forest. Three nearby U.S. Geological Survey rain gauges showed that the discharge of water at these sites was above the 100-year flood estimate.

Many areas, especially trails and roads along rivers or with steep slopes, suffered devastating damage. The massive movement of water carried woody debris and sediment, rolled boulders downstream, carved out wider banks, and jumped stream banks to find new routes – often rushing down adjacent roads or trails. Rocks, logs and soil caught up in the high waters created debris jams, clogged culverts and backed up behind bridges, causing bridges to fail, rivers to divert and flooding in areas that are normally high and dry.

The rain also caused extensive erosion, washing away roads and trails. Erosion in rock staircases along trails loosened stones and created unstable surfaces for hikers. Trail tread and road prisms slumped and sinkholes appeared. Bridge abutments were exposed and undermined, leaving poten-



The storm caused extensive damage to the popular Greely Ponds Trail.

tially unstable and unsafe crossings. Whole sections of roads and trails gave way to the massive flow of water.

Perhaps some of the most dramatic changes were in the riverbeds themselves. The massive amounts of water moved boulders, gravel, sediment and debris. This shift of materials created new pools, changing fish habitat. Stream channels were built up by the deposition and are now often higher in elevation than adjacent lands, trails or roads. Streams are wider or in different alignment in some places. Bridges and cul-

verts don't "fit" like they did before.

As we work to recover from this change, ecosystems will do the same. Rivers have been changed by this historic event, and it will take awhile for them to settle into a new equilibrium. Sediment deposited in floodplains and gravel bars will provide nutrients for plants. Fish will find new habitat in the logjams and pools created by the storm. Things are still dynamic, and we don't know what spring snowmelt or ice breakup will bring over the next couple of years.

We estimate the forest sustained \$10 million of damage to its infrastructure. White Mountain National Forest employees made emergency repairs to some areas right after the storm, and this work has continued. The U.S. Forest Service and its partners worked hard last fall and early winter to restore and stabilize some of the damaged areas, removing collapsed bridges, filling in eroded areas with gravel, and creating waterbars and manmade log jams to provide natural guides for high water to return to the riverbed. We built temporary bridges, repaired roads and trails and cleaned out culverts.

The storm may have passed, but there is still a lot of work left to do. The White Mountain National Forest has developed a priority list of trails, roads, bridges and recreation sites to work on in 2012. Our website (www.fs.fed.us/r9/white) explains the impacts of the storm, condition of the forest and ways people can help. We ask the public for patience as we work through funding challenges and the overall complexity of the recovery efforts. 

Correlations to N.H. Social Studies Framework: Geography (GE:3), Physical Systems.

Activities Related to Articles in this Issue

Project Learning Tree suggests:

In democratic societies, citizens have the power to influence the lawmaking process.

Democracy in Action helps students learn about the roles and responsibilities of citizens' groups in environmental policies and decision making.

In *People, Places, Things*, students explore the job opportunities in their own community, and learn how the community's well-being depends on the work of many different people.

Human attitudes and behavior with regard to the environment has changed over the course of time. In *the Good Old Days* helps students learn about the writings of men and women who have shaped the way people think about the environment.

Project WILD suggests:

Middle school students portray members of Native American groups in three regions of North America in *Changing Societies*.

In *Prairie Memoirs*, students analyze three

literary selections about bison that will enable them to describe how wildlife and habitat affect cultures and societies.

Watered Down History encourages students to create a mural based on their investigative findings of the history of a chosen waterway. Research includes taped personal interviews and reviews of public records.

Project WET suggests:

In *A Grave Mistake*, middle and high school students analyze data to trace the flow of contaminants in groundwater and conclude that past solutions, developed with the best of intentions, may create contemporary problems.

Super Bowl Surge allows students to propose solutions to a water management problem and recognize how presentation strategies influence public policy.

Students explore the interconnectedness of water users in a community and the complexity of resolving water shortages in *Water Works*.

New Correlations!

Projects WET, WILD and Learning Tree activities have been correlated to the K-12 Social Studies New Hampshire Curriculum Frameworks. To see the Project WET correlations, go to www.des.nh.gov, go to the "A to Z" list, click on "Project WET" and find a link to the correlations under "Hot Topics." For Project WILD correlations, visit www.wildnh.com/Education/project_WILD.htm. For PLT correlations, visit www.nhplt.org/resources.

They Sawed Up a Storm

Book Depicts the Work of Women in a Concord Sawmill during WW II

They Sawed Up a Storm, by Sarah Shea Smith, introduces an extraordinary group of women who operated a sawmill during World War II at Turkey Pond in Concord, N.H. Smith first learned about the women's mill from John Willey, the son of one of the women who worked there. Willey shared his mother Laura's scrapbook – a tattered collection of snapshots and newspaper clippings depicting the women at work between 1942 and 1943. The sawmill was built by the U.S. Forest Service to saw hurricane-salvaged logs still floating in Turkey Pond four years after the historic 1938 hurricane. The headline of the *Concord Daily Monitor* on October 26, 1942, read, "Women-Operated Sawmill, First of Kind in Country, Will Start Work Soon at Turkey Pond."

Interviews and family stories bring the women of Turkey Pond to life. Two important and historic collections contribute to this book: an archive of material about the timber salvage program from the National Archives and a stunning collection of photographs of the women taken by Depression-era photographer, John Collier. The Collier collection is housed at the Library of Congress and, while this collection of photographs is available via the Internet, *They Sawed Up a Storm* provides the context and personal history of many of the women in the pictures. The book appeals to a wide range of readers – particularly those interested in women's history, forestry, the World War II home front, the Great New England Hurricane of 1938 and the Roosevelt Era.

Author Sarah Shea Smith works at the University of New Hampshire Cooperative Extension as the forest industry specialist. "My job brings me in close contact with loggers and sawmill operators. I've also worked in the industry as a lumber grader, so I have an interest in and an understanding of the hard work that those working with wood do every day," said Smith. "I was intrigued by the women, who they were and where they came from."

In researching the book, Smith talked to a lot of people, starting with John Willey. From there, after a number of phone calls, she found two of the women, Barbara Webber and her sister Norma, who were



Hard-working women on a winter day at the sawmill, c.1942.

COURTESY PHOTO

21 and 18 at the time. Documents related to the 1938 hurricane salvage program in the National Archives and the Library of Congress rounded out the story.

To obtain a copy of *They Sawed Up a Storm*, go to www.turkeypond.com or call 603-862-2647.



Correlations to N.H. Social Studies Framework: US/NH History (HI:5), Social, Cultural.

Furbearers Give us a Window to the Past

By Mary Goodyear, N.H. Fish and Game Wildlife Educator

Following the history of furbearers in North America affords an intriguing opportunity to integrate science with social studies in the classroom.

Furbearers are those mammals that have been traditionally trapped for their fur. They include beaver, muskrat, mink, otter and marten. When Europeans first arrived in North America in the early 1600s, they found an abundance of natural resources, one of which was furbearers. The lure of profit from the fur led to the exploration and settlement of much of the continent. French, English and Dutch fur trappers and traders established a thriving fur trade with Europe. Wealthy Europeans paid top dollar for clothing made of beaver, mink and other furs.

The French explorer Samuel Champlain set up the first fur trading post in Montreal, Quebec, in 1608 to exchange goods for furs supplied from trappers and Native Americans. Other trading posts were established as the demand for furs grew. The pursuit of new sources of furbearers had trappers and traders extending their explorations further into the wilderness. The Voyageurs, primarily French Canadians, transported furs long distances by canoe and are legendary for their great strength and colorful character. Many of our continent's great industrial centers, including Manhattan, Philadel-

phia and Quebec City were first established as fur trading centers.

The huge demand and unregulated harvest of furbearers took its toll on their populations, which were eliminated in many areas. Beaver, for example, disappeared from most of the Northeast and were absent from New Hampshire from the 1750s to 1900. In addition, habitat disappeared as settlers cleared the forests for agriculture and building materials. The Northeast, once almost entirely forested, had been largely cleared by the 1850s. Later, widespread farm abandonment following the Civil War and the creation of wildlife harvest regulations slowly turned the tide in a more positive direction for furbearers.

To explore the role furbearers played in the settlement of North America with middle school students, educators are welcome to borrow a Furbearer Fundamentals curriculum kit from the N.H. Fish and Game Department. The kits include furs, many resources about the natural history of furbearers, their connection to human settlement and a sample unit plan. For information about how to borrow a kit, visit www.wildnh.com/Education.



Correlations to N.H. Social Studies Framework: Economics (EC:2), Basic Economic Concepts; Geography (GE:3), Physical Systems; (GE:4), Human Systems; and (GE:5), Environment and Society.

A River Runs Free

by Steve Landry, NHDES, Merrimack Watershed Supervisor

When the Maxwell Pond Dam on Black Brook was removed in the spring of 2009, the city of Manchester, in partnership with the N.H. Department of Environmental Services (DES) and fourteen other funding partners, had taken an important step. The physical removal of the 15-foot-high dam took just a few weeks, but the environmental degradation of Black Brook linked to this dam can be traced back to the late 1880s. That's when the crystal-clear waters of Black Brook, tumbling over bedrock, attracted the attention of the Amoskeag Ice Company, which constructed a dam to create a pond for harvesting ice blocks. By the 1990s, the excess sediment delivered by Black Brook into the impoundment, known as Maxwell Pond, had reduced the depth in the 8-acre pond from ten to three feet. By 1994, state officials determined that Maxwell Pond was unable to support aquatic life due to a lack of dissolved oxygen.

By 2006, the century-old dam was showing its age. DES ordered the city to either make necessary repairs or remove the dam. Shortly thereafter, two successive storm events caused the waters of Black Brook to surge around the dam, undermining Front Street, destroying property, and threatening to compromise the integrity of a gas main and an electrical conduit.

After costly cleanup, city officials voted to move forward with dam removal.

In 2007, the DES Watershed Assistance Section awarded the city \$105,000 through a restoration grant and assumed a lead role in managing the project. By February 2009, the \$500,000 project budget was secured and the DES Dam Maintenance Section began work. By March 2009, the entire spillway had been removed and Black Brook was once again cascading over bedrock where the Maxwell Pond Dam had acted as a barrier to fish migration for over a century.

Following the dam removal, Black Brook carved deeper into the accumulated pond sediments and revealed artifacts that date back to when ice harvesting was in full swing. The recovered artifacts are now part of the permanent archive and museum display in the Manchester Millyard Museum.

One of the more immediate benefits of removing the dam was the rebound of dissolved oxygen levels in the waters of Black Brook, once again restoring its ability to support aquatic species. Bridle shiners (a state-threatened species), sea lamprey, tessellated darters (host species for endangered mussels), and brown trout provide further evidence of the habitat improvements ush-



Black Brook now flows freely where Maxwell Pond Dam stood for more than a century.

ered in with the removal of the dam.

The dam removal and restoration project was highlighted in the 2010 American Rivers documentary titled "Restoring America's Rivers—Preparing for the Future," (www.americanrivers.org). The documentary depicts how communities across the nation are facing increasingly extreme storms that bring damaging floods. Black Brook is featured because of the direct impacts to the community of outdated infrastructure, the return to the natural condition that makes the surrounding community safer and more resilient to weather extremes, and the restoration of vital habitat for fish and wildlife.



Correlations to N.H. Social Studies Framework: Geography (GE:3), Physical Systems; and (GE:5), Environment and Society.

ANNOUNCEMENTS

Forest for Every Classroom

The *Forest for Every Classroom* program will educate middle and high school teachers about forest stewardship issues and provide them with tools to develop or modify curricula that meet the state's educational standards and can be implemented using their local landscape, resources and community for real world teaching. Graduate credits are available from Plymouth State University. This year-round professional development opportunity begins May 11-12 at the Hubbard Brook Experimental Forest, Woodstock, N.H. Visit www.nhplt.org.

Focus on NH Forests: A Project Learning Tree Workshop

Saturday, April 14, from 8:30-2:30 at the Conservation Center in Concord. This workshop will introduce formal and non-formal educators of grades K-8 to PLT's award-winning curriculum materials. PLT uses trees

and the local environment to introduce key environmental concepts to students. PLT activities are designed to help students learn to think critically and creatively about their relationship to the natural world. To register, go to www.nhplt.org

Upcoming Project WET Workshops

Due to the recent release of the new Project WET Curriculum and Activity Guide, several workshops are being scheduled around the state. To see a list of upcoming workshops, go to www.des.nh.gov, go to the "A to Z" List, click on "Project WET" and find a link to "Upcoming Workshop" under "Hot Topics."

National Project WET Educator Conference Comes to New England

The 2012 national Project WET conference will be held at Bridgewater State University in Bridgewater, Mass., from May 23 to 25. Open

to all educators. Check www.projectwet.org for details, or contact Alicia Carlson at alicia.carlson@des.nh.gov.

Explore! Investigate! Invent! How Science Inspires Engineering

The Museum Institute for Teaching Science (conducted in N.H. by Amoskeag Fishways, Beaver Brook Association and the N.H. Fish and Game Department) offers summer learning opportunities exploring how the natural world inspires engineering design. Classroom and outdoor field experiences. Hands-on methods and inquiry-based investigations. Offered in six regions of Massachusetts and Southern N.H. \$300/1 educator; \$275 each/team of 2 educators; \$250 each/team of 3 or more educators. Graduate credit available (additional cost). To register, visit www.mits.org; email mits@mits.org; or call 617-328-1515. Register by June 6.

ON THE H.O.M.E. FRONT

**Mapping the Schoolyard:
Using Science and Social Studies
to Enhance Sense of Place**

by Marilyn Wyzga

As the Buddhist saying has it, “Wherever you go, there you are.” But do you know how you got there, or how to get back? The more we rely on GPS units to direct us, the more we risk losing our skills for locating place and place-making through use of maps. Looking at what is around us – the landscape features, human habitation, the sun’s location in the sky – is a different experience from reading GPS-guided directions derived from satellite signals. Looking around and noting what we see builds observation skills and informs us of the human influences on the natural world. From these observations, we can create maps, using simple technologies like paper and pencil, or complex technologies such as Geographic Information Systems (GIS). Choosing what to map helps inform our sense of place and provides a tool (the map) for further study of our place.

In this article, we’ll focus on the Geography strand of the Social Studies frameworks, especially the first two substrands, “The World in Spatial Terms” and “Places & Regions.” As the frameworks state: “The real crux of geography is understanding our physical Earth and human-environment interaction... A geographically informed person can draw connections between locations of the Earth, recognize complex regional patterns, and appreciate the influence of place on human development.” Mapping the immediate schoolyard habitat is a great way to begin.



Teachers learn to map their site using a plane table, a field tool used by surveyors.

Observation and Data Collection

A map is a two-dimensional representation of a three-dimensional place, and includes those features the map-maker wants it to include. By observing their surroundings and making records of what exists on the site, students perform one of the most vital steps of the scientific process: making observations and asking questions. When your students map, they conduct scientific investigations, gathering data on natural resources in the schoolyard like trees, water and soils. Students may also monitor environmental conditions like weather and sunlight, and patterns of change.

The mapping process also involves students researching existing maps that include the schoolyard site, such as cover type maps and soil type maps (see S:ESS:1.2 Composition and Features of the Earth). Conducting the site inventory will also require students to conduct research. This might include using field guides to identify organisms, investigating town or county records to learn about human-built features such as roads and utilities, and reading historical documents about how the site was used and changed in the past. Data they collect is then compiled, displayed and interpreted by making and using maps, as they learn about the world in spatial terms.

People, Places and Environment

One of the ten social studies themes, “People, Places and Environment,” explores the interaction of humans with the physical environment, and its changes over time.

Humans utilize land areas in particular ways based on the availability of natural resources. Notice how settlements often grow from a seacoast or river bank; the water body or waterway historically allowed people to access the land and to move resources in and out. Wildlife furbearers offer an example of natural resource influencing early human settlement patterns, because those mammals inhabited areas where they could find suitable habitat, and humans followed them to hunt and trap for their pelts (see SS:GE:4: Human Systems).

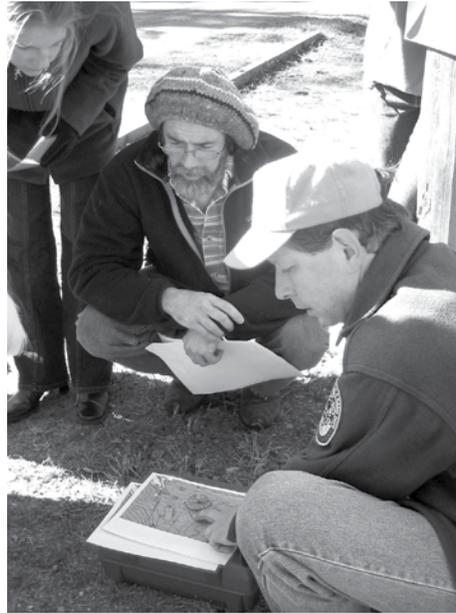
Knowing what is already on your site is crucial to determining how to enhance it. You and your students will need to be familiar with not only the physical and biological characteristics of the site, but also its socio-cultural characteristics, combining scientific study of the site with history and geography. Through the process of site inventory, students will come to appreciate that what is currently on the site is a result of the physical, biological and socio-cultural features that are present now and in the past. This understanding addresses many of the Geography standards, including places and regions, physical systems, human systems, and environment and society. You’ve read in this WEB issue about historical uses of natural resources, human impacts on natural resources and changing history through the removal of a Manchester dam to return a river to its original state. These kinds of activities and their outcomes might appear on your students’ maps if they occur

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on your site. (Check out the collection of maps housed at the N.H. Historical Society. Aerial photos are another valuable resource for seeing landscape changes over time.)

A fascinating feature of northeast America, which is very evident in New Hampshire's landscape, is a result of its unique geomorphology. You may have noticed that New Hampshire has few east-west routes on its western side. When early continents collided, the land was pressed in vertical folds (see SS:GE:3 Physical Systems). Roads and settlement patterns tend to follow the contours, rather than crossing these folds or ridges. Ridges and valleys also dictate water flow and watersheds. This is especially evident during "natural disasters" such as Tropical Storm Irene in the autumn of 2011, where we saw landforms influencing wind and rain patterns, and flooding.

In the schoolyard, students can map to capture changes over time, adding annually to a common pool of data. Model their work on "Teaming with Nature," a project of the Roger Tory Peterson Institute that was inspired by long-term nature studies conducted in the 18th century by Gilbert White (England's first ecologist) in Selborne, Hampshire. Using White's approach, students investigate an area one square kilometer in size, and learn science, language



Fish and Game staff demonstrate map and compass techniques to teachers.

arts, mathematics and social studies (www.rtpi.org/teaming-with-nature-teacher.html).

If your plans involve comparison of different types of maps, use of GPS or GIS for analysis of on-site features, students will recognize the importance of technology to the process and will become aware of how mapping technology has advanced, thus

addressing S:ESS:4.1 (Design Technology). Technologies like GIS and GPS can assist in gathering data and organizing that data to create maps. Keep in mind that scale will be a factor. Most schoolyards won't show the level of detail because they are so small. (Look into the courses offered by the Geospatial Technologies Training Center at UNH <http://extension.unh.edu/GISGPS/>, to learn more about using these and other digital mapping tools.)

Project HOME Social Studies Correlations

Map-making is the perfect integrated curriculum project. It is impossible to do it well without straying into all major curriculum realms. Correlation of the mapping process with the NH curriculum frameworks certainly shows this to be true, as matches can be made with Mathematics, Science and Social Studies frameworks. To see the full Project HOME correlations, visit www.wildnh.com/Education/project_HOME.html.

So the next time someone asks, "Where are you?" you and your students will have the tools and the skills to give them a more complete answer. 

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