The Virginia Wetlands Report

Winter 1997
Vol. 12, No. 1

Wetlands Program

"Playing" Wetland Board is Excellent Learning Tool for Virginia Beach Students

by Karla L. Schillinger

The apple-headed gavel struck the desk top precisely at 10:00 a.m. with a bang. The Waterton Wetlands Board public hearing was in session. Freckle-faced, twelve-year old Chairwoman Jessica McKinney read the opening statement and the first agenda item was addressed by the eleven-member Board.

Mr. Bill Dozer (Matthew Brothers, age 12), the well-dressed project manager representing Alterland Development Company, made his formal request to develop a parcel locally known as "Tillage Farm." Insisting that his company would "help the environment and the economy of Waterton," Dozer was proposing to subdivide the 55 acre farm into 14 single-family lots, filling in wetlands and dredging a pond. "You are not losing a past, you are gaining a future!" he contended, while flashing multicolored diagrams of proposed home sites. The Board carefully evaluated his six various development proposals, some including a recycling plant and an environmental research facility.

Stan Breadloaf (Hunter Gallagher, age 13), owner of the local general store, wasn't so confident of Bill Dozier and his grand plan. Breadloaf had fond memories of the Old Tillage Farm, having played in its fields as a child. Working with fellow neighbors, Breadloaf designed a seventh "Citizen Proposal" for consideration. Breadloaf's presentation included his own colorful site plan, numerous overheads, and a vast knowledge of the site and its history. His proposal included preserving the wetland, strict zoning restrictions, and selling the property to locals.

Kemps Landing Magnet School students learn wetland management through role playing.

Local logger Hank Boardman (Gordon Marx, age 13), supported the Alterland Development Company and their project, provided all forested areas proposed for cutting were compensated for elsewhere on the site with sapling plantings. Phoebe Byrd (Phyllis Kung, age 13), the local environmental activist, was "horrified by the proposal" for Tillage Farm and suggested that the Audubon Society purchase the old farm, reserving it as a preserve for everyone to visit and enjoy.

At this time you may be thinking, "Not the usual Wetland Board hearing." Indeed, it was not! This was a Wetland "Role Playing Game" by the Kemps Landing Magnet School's eighth grade class. Designed by Catherine Kashanski of the Vermont Agency of Natural Resources, Water Quality Division, and promoted by the National Wildlife Federation, this was an educational tool. Instructed by Jenny Sue Flannaghan, the students were experiencing first-hand, what Wetland Board members throughout the area experience each month. These gifted students were faced with considering the ramifications of approving a proposed project, having to weigh the economic benefits against natural resource losses.

After the initial project briefing, the students took on the responsibility of playing their previously-selected character. Compromises were dis-

cussed, and negotiations reviewed by Board members and the public alike. The students portrayed their characters well, and all in view of the public eye during the public hearing forum. A partisan twist even came about when a citizen member in the audience cried out, "It's obvious there are more republicans on this Board than democrats!"

Following considerable deliberation and digestion of guidance information provided by U.S. Army Corps of Engineers representative Kathy Spencer, the Waterton Wetland Board approved of the project in a modified form. Provided the Audubon Society would purchase the wetland, Alterland Development Company could develop up to four homes (down substantially from the original 14) and one energy research facility. Limitations were determined for tree removal, and a fifty foot buffer was established on all wetlands. (Profits were not a goal!)

Upon the closing of the Waterton Wetland Board, it was determined that the goals of the "Role Playing Game" were successfully met. By way of a collective decision, the students protected the wetland ecosystem and allowed for the needs and concerns of the people of Waterton. Additionally, they learned how to conduct a public hearing, how to solve problems as a group, and how important it is to properly prepare to address a board. After all, these are our future Wetland Board members!

Karla L. Schillinger is an Environmental Engineer (Wetland Board staff) for City of Norfolk's Department of City Planning and Codes Administration's Bureau of Environmental Services.

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In this Issue:

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Sixteenth Annual Virginia Wetlands Management Symposium

Saturday, February 22, 1997, 9 a.m. - 4 p.m.
Turner Hall Auditorium, Hampton University

Sponsors:	Virginia Marine Resources Commission and Hampton University Center for Marine and Coastal Environmental Studies
Purpose:	To provide a forum for discussion of issues important to local Wetlands Boards.
Format:	Presentations with audience participation
Registration Fee:	$15.00 (Non-refundable - includes break refreshments and lunch)

Agenda

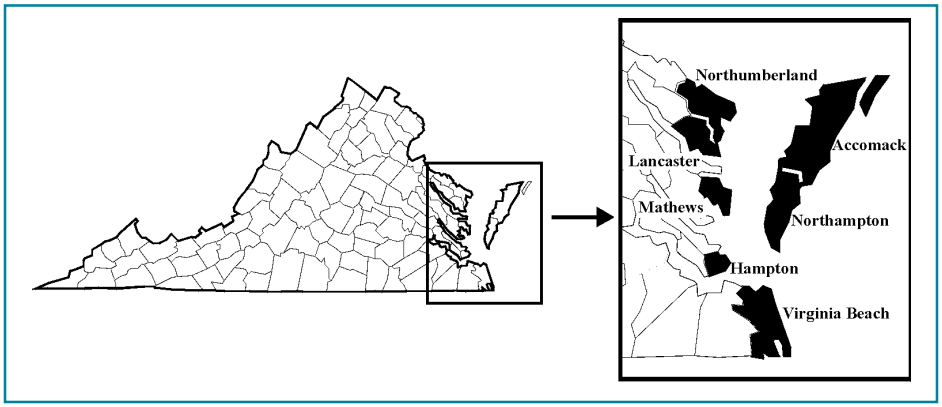
9:00 - 9:30 a.m.	**Registration** (coffee and doughnuts provided)
9:30 - 9:45	**Welcome and Opening Remarks**
9:45 - 10:15	**Breakwater Design** Neville Reynolds, Vanasse Hangen Brustlin, Inc. Keith Cannady, City of Norfolk
10:15 - 10:30	**Break**
10:30 - 11:00	**Compliance Initiatives and Results** Tony Watkinson, Virginia Marine Resources Commission Josie Wold, Northern Neck Wetlands Board
11:00 - 12:00 p.m.	**Mitigation Banking—Wetlands Board Input for Guideline Development** Jeff Madden, Virginia Marine Resources Commission Thomas Barnard, Jr., Virginia Institute of Marine Science Kirk Havens, Virginia Institute of Marine Science
12:00 - 1:30	**Lunch** (provided)
1:30 - 2:30	**National Geographic Film "Lifestyles of the Wet and Muddy"** Filmed on Virginia's Eastern Shore by Michael Male and Judy Fieth
2:30 - 2:45	**Break**
2:45 - 3:00	**Emergency Permitting—Panel Presentation and Discussion** Robert Grabb, Virginia Marine Resources Commission Bruce Williams, U.S. Army Corps of Engineers John Hill, Lancaster County Wetlands Board Gunnar Jagdmann, Little Bay Services
3:45 - 4:00	**Summary Remarks and Adjournment**

Wondering about Wetlands

William Roberts

Q What is the Coastal Primary Sand Dune Protection Act?

A During the 1980 session of the Virginia General Assembly, legislation controlling development in coastal primary sand dunes was adopted. The Coastal Primary Sand Dune Act was adopted to protect sand dunes located along the Eastern Shore, the Atlantic beaches south of the Chesapeake Bay entrance and the inner-bay shoreline. Presently, only the Cities of Norfolk, Hampton and Virginia Beach as well as the five inner-bay counties of Accomack, Lancaster, Mathews, Northampton, and Northumberland are authorized to adopt the model ordinance and regulate activities on dunes and beaches under the act.

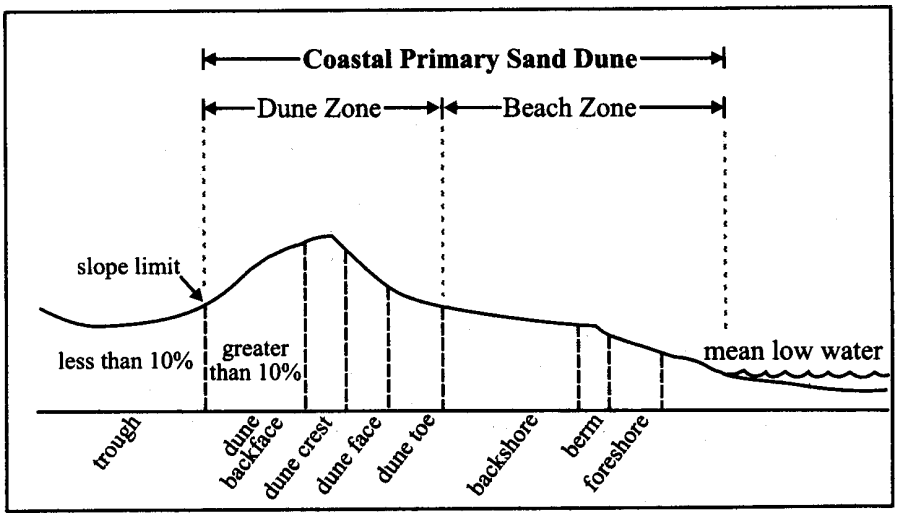


Virginia shorelines subject to the Coastal Primary Sand Dunes Protection Act.

In adopting this protective legislation, the Commonwealth recognized the importance of coastal primary sand dunes, and the associated foreshore comprising the beach, as protective barriers against flooding and erosion in coastal areas. Together these two zones, the dune and its associated beach, form the coastal primary sand dune system which is protected under the Act as a functional unit. A healthy beach zone was recognized as a natural erosion buffer which dissipates the erosive forces of waves as they break and roll up the beach slope. Dunes act as repositories for sand and function to replenish sand to the associated coastal beaches while acting as a flood barrier and providing habitat for fauna and flora.

According to the Act, a dune is defined as: 1) a mound of unconsolidated sandy soil which (2) must be contiguous to mean high water (3) and must have, as of July 1, 1980, growing upon any part of the dune any one or more of ten plant species associated with sand dunes. The landward and lateral limits are normally marked by a change in grade from 10% or greater, to less than 10%. The dune, however, may not necessarily have a distinguishable trough but may extend landward to a man-made structure such as a highway or terminate at a naturally occurring upland feature.

It is important to realize that sand dunes in coastal Virginia can vary considerably in physical size and appearance. Sand dunes of the Atlantic shoreline can typically reach 8 to 12 feet in height while dunes located in those counties comprising the inner-bay shoreline will often be no more than several feet high and usually resemble a sandy ridge running along the shoreline.



In 1989 the General Assembly revisited the Coastal Primary Sand Dune Act to clarify the definition of a "beach" and insure protection under the Act. Often a beach is present without an accompanying dune and under these conditions a

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— Feathers & Fins —

Double-Crested Cormorant

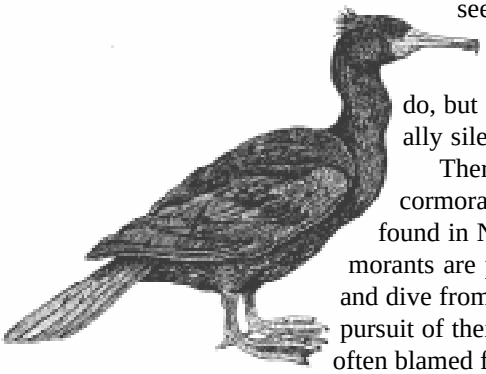
(Phalacrocorax auritus)

Julie Bradshaw

One of the familiar perennial "fixtures" in the Chesapeake Bay is the double-crested cormorant. Along with gulls, this dark water bird is often seen resting on pilings, duck blinds, and other structures in the waters of the Bay. Because the feathers of the cormorant are not completely waterproof, it must periodically leave the water for a dry perch and extend its wings out to be dried by the sun and wind. Its other familiar position is sitting in the water, where it is often confused with loons. Both cormorants and loons are approximately the same size and sit lower in the water than ducks or geese. The end of the cormorant's bill is hooked downward, and the bill itself is tilted upward. The common loon's (*Gavia immer*) bill is thicker and is generally held parallel to the water.

The adult double-crested cormorant is black, while young in their first year have brown backs and light underparts. The base of the bill and throat of both young and adults are orange. Another species, the great cormorant, is uncommon in the Chesapeake Bay, but may be seen in winter. It has a stockier bill and, generally, lighter belly than the double-crested.

The double-crested cormorant may be seen year-round in Virginia. Its nesting colonies in the Commonwealth have been found in trees, on the ground, and on a duck blind (Center for Conservation Biology, 1995). It may also be seen migrating, when it flies in groups in V-formation, as geese do, but cormorants are generally silent.



There are 30 species of cormorants, 6 of which are found in North America. Cormorants are primarily fish-eaters, and dive from the water surface in pursuit of their prey. The birds are often blamed for robbing fisherman's nets, but studies in other areas suggest that they generally take only non-commercially important species and/or fish too small for fisherman to keep. Their great fishing skill led to their use, particularly by the fishing industry in Asia, in a sort of "aquatic falconry" (van Tets,

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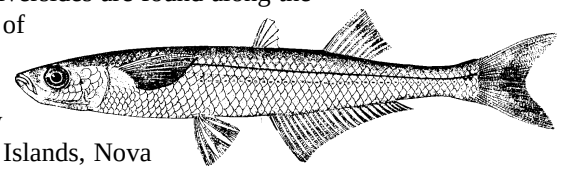
Atlantic Silverside

(Menidia menidia)

Lyle Varnell

Although not commercially or recreationally important, the Atlantic silverside is one of the most valuable fish species to the Chesapeake Bay. It is a primary and abundant food source for many top level marine predators which have direct value to commercial and recreational fisheries such as striped bass, bluefish and the seatrouts. They are also one of the Bay species most dependent upon tidal wetlands.

Atlantic silversides are found along the Atlantic coast of North America from approximately the Magdalen Islands, Nova Scotia to Florida. Their only close relative is *Menidia beryllina*; a freshwater species which can be found in the upper reaches of the Chesapeake Bay tributaries. *M. menidia* is characterized by an elongate and slender body. They are colored transparent green to greenish yellow above, and silvery below with a white belly. Their common name is derived from the well defined and bright silver band located on each side and running from the base of the upper pectoral fin to the base of the caudal fin. The two dorsal fins are widely serrated and the tail is forked. The anal fin is the distinguishing characteristic between *M. menidia* and *M. beryllina*. The edge of the anal fin of *M. menidia* is straight, whereas the edge of the anal fin for *M. beryllina* is prominently concave.



Silversides spawn in schools in intertidal zones within estuaries from April to June in the mid-Atlantic region. Adult females generally produce between 300 and 1500 eggs per individual. The eggs are demersal and attach to grasses, sand grains, and other structures in the intertidal zone. They can be found either in clusters or scattered individually. Hatching can occur within 4-30 days, depending upon temperature.

After hatching, larvae inhabit the Bay from May through November. Larvae aggregate at the surface in intertidal areas and adjacent nearshore shallow waters. Juveniles prefer vegetated habitats over open sandy areas. Maturity is reached at one year old and 50-90 millimeters total length.

Adults generally follow the tidal ebb and flow in large schools onto sandy and/or gravelly shores, beaches and tidal creeks. Adults do not seem to prefer rocky shorelines; therefore, riprap may not provide suitable habitat for this species.

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Medicinal Uses of Wetlands

Pam Mason

I thought that for this issue of *The Virginia Wetlands Report* it might be fun to present some of the more interesting (if not a little bizarre) medicinal uses of plants which occur in wetlands. A popular argument for the preservation of natural ecosystems is the potential, and yet unknown, medicinal value of many native plants. This argument has been used rigorously, and with scientific validity, for the preservation of the rain forest. Many modern medicinal drugs are derived from plant material or are synthetic reproductions of plant compounds. Given the on-going effort to discover new medicinal treatment for what ails mankind, and the resurgent interest in homeopathic medicine, it seems timely to review some of the medicinal value of plants commonly found in Virginia's wetlands. While most of the uses documented are historic uses by Native Americans, some uses were adopted, or brought to North America, by the colonists. And who doesn't have some of grandma's folk remedies like peppermint for upset stomach, or chamomile tea for a calming effect.

Medicinal value has been attributed to an amazing suite of plants and to all growth forms from herbaceous plants, to shrubs, trees and even vines. One of the more well known medicinal plant uses is that attributed to the various members of the willow family (*Salix* spp.) The bark was steeped to make a tea to treat fever and pain, and was also made into a poultice for cuts, poison-ivy rash and other skin ailments. The active material found in the bark is salicylic acid, the precursor to the semisynthetic drug, aspirin (acetylsalicylic acid). Sweetgum (*Liquidambar styraciflua)*, was widely used as a folk remedy to treat several ailments, and it is still used in medicinal compounds. The gum, or resin, was chewed for sore throats, coughs and colds, while an astringent made from the inner bark was used to treat diarrhea and cholera.

Another medicinal tree is the slippery elm (*Ulmus rubra*). When brewed, the inner bark makes a thick tea used for upset stomach, indigestion, ulcers and diarrhea. The brew was also used as a nutritive source for children, the elderly and convalescent patients. Powdered inner bark was used to make a poultice for external application to wounds and burns. Scientific evidence confirms the soothing properties of the concoction.

The varied historic uses of herbaceous plants make them an even more interesting subject since they include, use as stimulants and aphrodisiacs, and as a cure for impotence in addition to treatment of other various ailments. A wide range of medicinal values has been attributed to *Acorus americanus*, commonly known as sweetflag. The root of the plant is believed to act as an anticonvulsant and central nervous system depressant. Research on sweetflag shows that plant oils may have properties similar to standard antihistamine drugs. In India, the plant is believed to have aphrodisiac properties, and Native Americans used it as a stimulant. A folk treatment for the removal of freckles and pimples was made from a mixture of lemon juice and the root of the water-lily, *Nymphaea ordorata*. A poultice made from the root of lizard's tail, *Saururus cernuus*, was used by Native Americans to treat inflammations. Common smartweed, *Polygonum hydropiperoides*, has an acrid peppery taste and was used by American Indians to stop thumb sucking in children. Tea made from the leaves of the smartweed was considered a folk remedy for internal and menstrual bleeding, as a diuretic and as a treatment for fevers.

Although many of the plants described above have attributed medicinal uses, the author does not recommend experimentation by the novice. "See your doctor or health care professional."

Reference:

Foster, S. and J. Duke. 1990. *A field guide to medicinal plants: Eastern and Central North America.* The Peterson Field Guide Series. Houghton Mifflin Company. Boston. 366 Pp plus color plates.

Double-Crested Cormorant
continued from page 4

1985) whereby the birds were employed to catch fish but were prevented from swallowing them by rings placed around their necks by the fishermen.

Another species, the guanay cormorant (*Phalacrocorax bougainvillii*), has been called "the most valuable wild bird in the world" (Terres, 1980). It nests in large colonies on islands off Peru, where it produces tremendous amounts of excrement, or guano. Its guano is very rich in nitrogen, phosphorus and other materials and has been the basis for very large commercial fertilizer harvesting operations for over a century (Nelson, 1985).

References:

Center for Conservation Biology. 1995. Virginia double-crested cormorant population tops 400. p. 17 *In:* Cornerstone. The Center for Conservation Biology at William and Mary. Vol. 1, No. 1. Williamsburg, VA.

Nelson, Joseph Bryan. 1985. Guano. p. 265 *In:* Campbell, Bruce and Elizabeth Lack (eds.). A Dictionary of Birds. Buteo Books. Vermillion, S. Dakota. 670 pp.

Terres, John K. 1980. *The Audubon Society Encyclopedia of North American Birds.* Alfred A. Knopf. New York. 1109 pp.

Van Tets, Gerard Frederick. 1985. Cormorant. p. 110-111 *In:* Campbell, Bruce and Elizabeth Lack (eds.). A Dictionary of Birds. Buteo Books. Vermillion, S. Dakota. 670 pp.

Calendar of Upcoming Events

Feb. 22, 1997	**Sixteenth Annual Virginia Wetlands Management Symposium** Turner Hall Auditorium, Hampton University, Hampton, Virginia. Contact: Dr. Robert M. Jordan at 804-727-5783 or 5295. (See agenda on page 2 of newsletter.)
Feb. - Dec. 1997	**1997 VIMS Wetland Education Programs** (See course offerings on page 8 of this newsletter.)
March 8-9, 1997	**4th National Marina Research Conference** Irving (Dallas-Ft. Worth), Texas. For additional information, contact the International Marina Institute at 401-294-9558.
June 1-6, 1997	**18th Annual Society of Wetland Scientists Meeting.** "Wetlands Heritage and Stewardship." Montana State University, Bozeman, Montana. Contact: lee_ischinger@nbs.gov.
July 20-26, 1997	**Coastal Zone '97** Boston Plaza Hotel, Boston, Mass. Contact: Dr. Martin C. Miller, USAE Waterways Experiment Station, Attn: CEWES-CR-O, 3909 Halls Ferry Road, Vicksburg, MS 39180.
Oct. 12-16, 1997	**Estuarine Research Federation's 14th International Conference** "The State of Our Estuaries." Rhode Island Convention Center, Providence, RI Contact: Joy Bartholomew at 410-586-0997; jbarth@cbl.cees.edu.

Wondering About Wetlands
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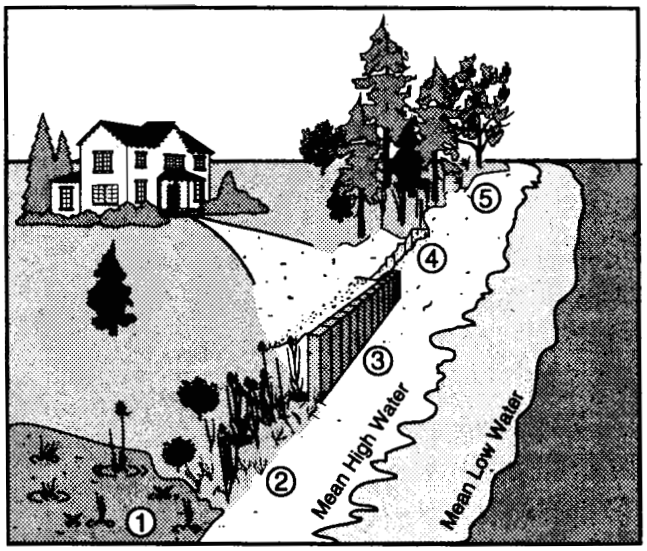
beach is defined as "the shoreline zone comprised of unconsolidated sandy material upon which there is a mutual interaction of the forces of erosion, sediment transport and deposition that extends from the low water line landward to where there is a marked change in material composition or physiographic form such as a dune, bluff or marsh. When no such change can be identified, the beach extends to the line of woody vegetation, or the nearest impermeable man-made structure such as a bulkhead, revetment or paved road."

Under this Act, activities such as the construction of bulkheads or riprap revetments within the beach or sand dune zone are regulated and require a permit from the local wetland board. Alteration of an existing sand dune, as defined by the Act, is also regulated and requires a permit. Additional information is available in the *Coastal Primary Sand Dunes/Beaches Guidelines* published jointly by the Virginia Marine Resources Commission and VIMS or the VIMS Technical Report No. 93-6, *Natural Resource Management in Coastal Virginia*, by Pamela Mason.



Landward limits of beach as defined by: 1) marsh; 2) change in material composition; 3) man-made structure; 4) change in physio-graphic form; and 5) line of woody vegetation.

GIS Geographic Information System

GIS as an Educational Tool

Marcia R. Berman

In previous articles lengthy discussions have addressed uses for GIS in the resource management, land use planning, and environmental arenas. The focus has perhaps left the reader with the assumption that GIS is a technology reserved for highly trained, computer literate technicians or scientists. While it is true that certain applications require fairly sophisticated levels of training, today GIS is finding its way into grade school classrooms and libraries as learning tools for young children and adolescents. In school systems which have made the investment in basic computer hardware and software, taking the next step to installing a GIS is no longer a giant leap.

In the schools, students are using GIS to study geography, follow political science, foreign affairs and public health, and in earth science applications. Teachers can easily expand traditional curriculum to include demographic and land use planning activities, resource management, and environmental science with the availability of GIS. Students can learn principals of environmental planning and the potential impacts that development might bring to bear on natural resources. With simple GIS packages, students can plot the distribution of population densities across the United States, or trace historic weather patterns and rainfall records for their community. They can examine worldwide sea temperature data, or pinpoint significant archaeological findings around the globe.

Kathryn Keranen, Lance Hill and John LaFever, team teachers at the Thomas Jefferson High School for Science and Technology in Fairfax County, Virginia, have aligned their seniors with the local Lake Barcroft Watershed Improvement Project. Students there are using GIS data and satellite imagery to answer questions in the Cameron Run watershed about the distribution of phosphorous, soil types, and land cover patterns. Using ArcView 3 and Idrisi software, students have geo-referenced and mapped the location of well sites in preparation for groundwater studies which will be used to assist in the Lake Barcroft project. The teaching team is working towards expanding GIS to other public schools throughout the County of Fairfax.

ESRI (Environmental Systems Research Institute), the developer of ArcInfo and ArcView GIS software, has initiated a program known as Adopt-a-School which promotes the use of GIS in grades K-12. The merits of this program are realized at Seaside High School in Seaside, Oregon where students use GIS to study the coastline. Under the direction of science teacher Mike Brown, students collect and process water samples and benthic invertebrate data, perform field mapping, and store data in the GIS for analysis. The school's Coastal Studies and Technology Center, headed by Brown, was honored by President Clinton in May, 1994 (ESRI, 1996).

Reference:

ESRI, 1996. Seaside High School integrates ArcView into science curriculum, Arc News Articles, May 22, 1996.

Special thanks to:

Berch Smithson of the VIMS Comprehensive Coastal Inventory Program for providing information and to Ms. Kathryn Keranen of the Thomas Jefferson High School for Science and Technology.

Atlantic Silverside
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Overwintering is believed to occur in either shallow nearshore and Bay waters or on the inner continental shelf.

The diet of the Atlantic silverside includes primarily small crustaceans such as amphipods, copepods and mysids. Gut contents have also documented worms, insects, algae and nektonic eggs.

The importance of this species to the general ecology of the Chesapeake Bay cannot be overstated. And neither can the importance of tidal wetlands to this species be overstated. *M. menidia* is highly dependent upon tidal wetlands as spawning, nursery and feeding grounds; and as habitat for adults. It is also an important food source for many of the Bay's higher predators. Therefore, it is a prime example of a link between tidal wetlands and other Bay marine fauna.

1997 VIMS Wetland Education Programs

February 26 - 27,
$200.00
Winter Botany - Public and Agency
Field clothing, notebook, hand lens, hand clippers, sharp knife, and ruler needed.
Limit: 15 participants

May 6 - 9
$400.00
Wetland Identification and Delineation - Public and Agency
Field clothing and notebook needed.
Limit: 30 participants

June 18
$15.00
VIMS Tidal Seminar - Public
Lunch included.

July 15 - 18
$400.00
Wetland Plant Identification - Public and Agency
Field clothing, botanical guides, hand clippers, hand lens, and ruler needed.
Limit: 20 participants

October 21 - 24
$400.00
Wetland Mitigation and Compensation - Public and Agency
Field clothing and notebook needed.
Limit: 30 participants

December 11 -12
$200.00
Winter Botany - Public and Agency
Field clothing, notebook, hand lens, hand clippers, sharp knife, and ruler needed.
Limit: 15 participants

(Cut on line or photo-copy page and mail back.)

Course Registration

Name:_____

Address:_____

_____

Affiliation:_____

Phone:_____ FAX_____

- Please register as early as possible. We MUST limit the number of participants in each class— first come, first served!
- Course fees accepted until first day of class.
- Course offerings based on minimum of 10 participants.
- Specific instructions concerning each course will be sent after registration.
- Lodging information available at FAX (804) 642-7179.
- Questions? Call William Roberts at (804) 642-7395.

Mail form to: Wetland Educational Programs
Attn: Bill Roberts
Va. Institute of Marine Science
P.O. Box 1346
Gloucester Point, Virginia 23062

Desired Courses:

1._____

Date:_____

Fee:_____

2._____

Date:_____

Fee:_____

3._____

Date:_____

Fee:_____

Total Course Fees:_____
(Make check payable to VIMS)