

The Virginia

Wetlands Report

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Department of Environmental Quality (DEQ)

Implementing Nontidal Wetlands Protection Mandate

Ellen Gilinsky, Ph.D.

Editor's Note: *The 2000 General Assembly session passed legislation authorizing the development of a new regulatory program for nontidal wetlands in Virginia. The Governor has signed the legislation and the new program is to be implemented by the Department of Environmental Quality (DEQ). The program will allow the Commonwealth to address issues such as Tulloch ditching, which impact nontidal wetland resources, but which occur outside of federal regulation. The General Assembly was motivated to pass the new legislation by commitments made by Governor Gilmore and his predecessors to achieve no net loss of state wetland resources.*

The legislation was crafted following an extensive review of existing programs, existing wetland resources, threats to those resources, and methods for preserving the public benefits derived from wetlands in Virginia. The final bills passed by the legislature were a product of intensive debate and compromise. They reflect the legislature's desire that the new program be structured to be effective, fair, and efficient. DEQ has been tasked with a demanding timetable for implementation, and the department has moved quickly to meet those goals. Dr. Ellen Gilinsky has been hired by the Department to head the program. Dr. Gilinsky comes to DEQ with an extensive background in wetlands, and years of experience working with the existing state and federal wetlands programs.

The Wetlands Report asked Dr. Gilinsky to summarize DEQ's current activities for our readership. We appreciate very much her taking time out of her obviously very busy schedule to keep us informed as to the activities, participants and the implementation schedule that DEQ has established in order to fulfill the legislated framework set down by the General Assembly this year. This is her report.

The actions of the 2000 General Assembly have given the Department of Environmental Quality (DEQ) a clear mandate to revise the existing Virginia Water Protection Permit (VWPP) regulations, which have served since 1992 as the Commonwealth's nontidal wetlands program through the Section 401 Certification process. Prior to July 1, 2000, the VWPP regulations required applicants seeking a Section 404 Permit from the Corps of Engineers for placement of fill in wetlands or waters of the United States, to also obtain a DEQ permit or waiver under Section 401 Certification for the same activity. By their actions this year, the General Assembly removed the dependence of the VWPP program on the issuance of a Corps permit, thus enabling DEQ to regulate activities, such as excavation in wetlands and fill in isolated wetlands, which are not currently under federal jurisdiction. In addition, the General Assembly directed DEQ to develop General Permits for similar classes of activities with minimal impacts in order to expedite the permitting process in

Virginia while maintaining the same high environmental standards as the individual permitting process.

The changes mandated by the General Assembly build on the existing VWPP Program, while creating a nontidal wetlands program independent of Section 401 Certification. Key aspects of the new legislation that will be incorporated into the VWPP Program include:

- § Regulation of new excavation in wetlands (Tulloch ditching) as of July 1, 2000
- § Regulation of other activities in a wetland that cause drainage of wetlands as of October 1, 2001
- § Regulation of activities in isolated wetlands as of October 1, 2001
- § Increase in permit term from 5 years to the length of the project, not to exceed 15 years
- § New permit review times, with a 15 day window for DEQ application review to determine completeness and a 120 day period in which to issue or deny a permit or decide to conduct a public hearing
- § DEQ must consider cumulative impacts to state waters and fish and wildlife resources when issuing wetland permits
- § Acceptable forms of mitigation are specified, and include creation, restoration, mitigation banks, preservation of wetland or upland buffers in combination with the above, and approved compensatory funds

- § DEQ can be a signatory to mitigation banking agreements
- § DEQ is to seek a State Programmatic General Permit by July 2002

In addition DEQ has been directed to develop General Permits for the following types of activities causing impacts to wetlands:

- § Impacts of less than 0.5 acre of wetlands,
- § Activities of utility and public service companies

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The views expressed herein are those of the authors and do not necessarily reflect the views of NOAA or any of its subagencies or DEQ.

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- § Linear Transportation Projects, both public and private
- § Activities covered by Corps Nationwide and Regional Permits
- § Mining activities for coal, natural gas, coalbed methane gas and sand

To accomplish these changes, DEQ has formed a Technical Advisory Committee (TAC) to work with DEQ staff in revising the VWPP regulation and developing General Permits. Over 60 nominations to serve on the TAC were received, and the selected membership of 30 individuals represents a balance between business and industry, local government, federal agencies, state agencies, academic institutions and environmental conservation organizations. The TAC will meet eight times from June through October 2000 to make their recommendations. In addition, an informational Public Hearing will be held on August 10, 2000 at 2:00 PM in House Room C, General Assem-

bly Building, 9th and Broad Streets in Richmond to hear the public's comments on this important subject.

Drafts of the revised VWPP regulation and new General Permits will be presented to the State Water Control Board at their December 2000 meeting. These drafts will then be public noticed and comments will be received in early 2001. The 2001 General Assembly session will also be taking a look at the draft regulations and permits. Guidance for implementation of the regulations and permits will be developed concurrently with input from the public. Any needed revisions will be made and the final versions will come before the State Water Control Board by September 2001 for implementation in October 2001. DEQ will also be working with the Norfolk District Army Corps of Engineers to obtain a State Programmatic General Permit for all or portions of impacts covered by state General Permits once the program is implemented.

Related websites:

- Virginia Legislative Services** (text of new wetlands law): <http://leg1.state.va.us/cgi-bin/legp504.exe?001+ful+SB648ER2>
- Virginia Department of Environmental Quality** (for nontidal law updates): <http://www.deq.state.va.us/>
- EPA Wetlands homepage:** <http://www.epa.gov/OWOW/wetlands/>
- National Wetlands Inventory:** <http://www.nwi.fws.gov/>
- VIMS Wetlands Program:** <http://www.vims.edu/ccrm/wetlands.html>

Sherman T. Holmes Sr.

Sherman T. Holmes, a man who likely personified the local wetlands manager that the General Assembly envisioned in fashioning its local option wetlands legislation, died July 14th due to a sudden heart attack. Mr. Holmes was 86. He was a member of the Middlesex County Wetlands Board for more than twenty years, many of which he served as Chairman. Those of us fortunate enough to have worked with Mr. Holmes over the years knew him as a passionate conservationist and public servant. Mr. Holmes was however, always a gentleman and possessed an innate sense of fairness that characterized his years on the Middlesex Wetlands Board and guided his interactions with his neighbors and fellow citizens, in and out of Middlesex County.

Sherman Holmes was a teacher, business man, author, family man, concerned citizen and leader. He was honored by the Rotary Club in March of this year as The Pride of Middlesex. He will be sorely missed by Middlesex County but his influence extended far beyond county borders. He will long be remembered by those in the wetlands management community for the example he set over almost 25 years of service in local water protection and wetlands conservation.



Varied & Versatile Wetlands

Sago Palm

Pam Mason

In some tropical locales of the planet, the lack of good agricultural lands has resulted in resourceful peoples looking elsewhere to find sustenance. In areas of Southeast Asia, the islands of the South Pacific, and parts of South America, low-lying freshwater swamp environments are common and agricultural lands are marginal in production. These swamps are home to the sago palm. Sago may be found in small clumps in dense forests, or in pure monotypic stands. Sago palm is actually a common name for several genera of palms; common to Indonesia are *Metroxylon*, *Arenga*, *Caryota* and *Corypha*, and in South America, *Mauritia* and *Guilielma*.

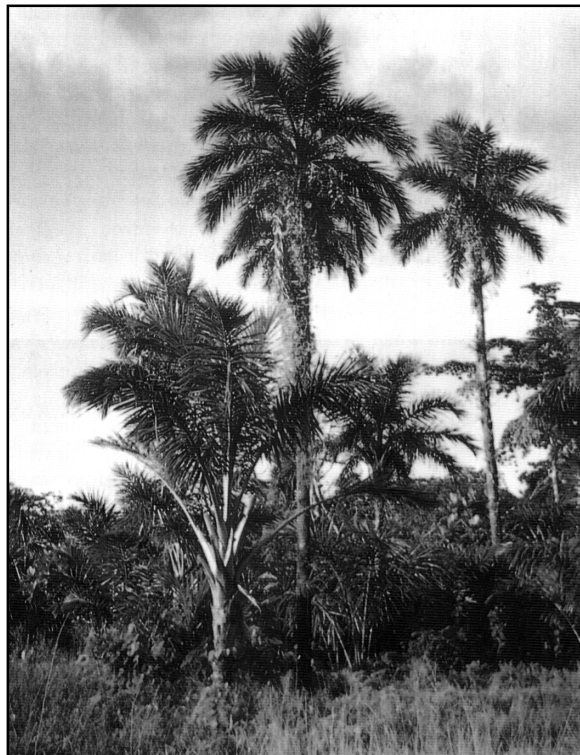
Sago palms grow to a height of 30 feet and have thick trunks. The plant matures in about 15 years and the pith of the trunks is full of starch. The trees are harvested just as the plant flowers. If fruit was allowed to develop from the flower, all the starch resources would go into the production of fruit. Once harvested, the pith is chopped and kneaded with water to extract the starch. After repeated washings, the wood fibre is left behind and the resulting sago meal is ready for use. The meal can be ground into flour or, alternatively, mixed with water to form a paste and rubbed through sieves producing pearl sago (similar to tapioca).

Sago has a very high carbohydrate content, about 95% of its dry weight. This compares well to other sources of starch, such as rice (75%) and corn (64%). Sago palms are managed to provide multiple benefits to local communities; self-sufficiency, sustainability and traditional products. Sago grubs (beetle larvae) are an important protein

source and the sago sap and fruit are other food products of the sago. A very important consideration for tropical locales, cooked sago food products can be stored for months (The Australian National University¹ 1998).

Sago palm also has a number of non-food uses among the Indonesian and South American peoples. Young stems are used as construction material for canoes and leaf fronds of the plants are a long-lasting roofing material. Additionally, Sagoes convert solar energy to starch with great efficiency. The starch is then easily converted to ethanol for fuel.

A basic food in the southwest Pacific, Sago is used for soups, cakes, puddings and snack foods. Elsewhere, it is used for pudding and as a thickening agent.



Metroxylon amicarum in various stages of growth.
Photo from Palms Throughout the World
by David L. Jones.

One use for pearl sago is in the preparation of the Indian snack **Sago Vada** (Your Indian Cook Bawarchi Contributions²)

Ingredients

1 cup Pearl Sago (also called Saboodana in Indian cuisine)
2 medium Potatoes
4 tsp. Ground Peanuts
1 bunch Mint leaves
4 green Chilies
½ tsp. Turmeric powder
One piece of Ginger- optional
Salt to taste
Oil for frying

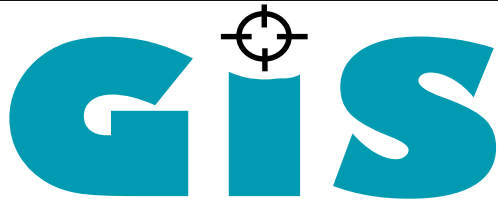
Instructions

1. Soak the sago in water for 10-15 minutes and then drain (Sago will become soft).
 2. Boil and mash potatoes.
 3. Grind chilies and mint (or ginger) into a paste.
 4. When sago becomes soft like a sponge, add the mashed potato, ground chile mixture, ground peanuts, turmeric powder and salt to taste. Mix well.
 5. Form the dough into small balls and press into patties.
 6. Fry until golden.
- Sago vada should be served hot with tomato sauce.

Look for sago in Indian or Oriental markets. If you try the recipe, let us know how it turns out.

¹The Australian National University. The sago palm: a natural and renewable resource for the future. URL : <http://www.anu.edu.au/Forestry/wood/nwfp/sago/sagoword2.html>.

²Your Indian Cook Bawarchi Contributions. Sago vada. <http://www/bawarchi.com/contribution/contrib1586.html>.



Geographic Information System

A New Land Cover Data Set Now Available For Virginia's Tributaries

Marcia Berman

The Comprehensive Coastal Inventory Program (CCI) at VIMS has just released a new data set which classifies land use and land cover for one Landsat satellite scene captured in July, 1997. The scene spans a major portion of Virginia's tributaries to the western shore of the Chesapeake Bay. This will be a valuable product for individuals with an interest in this geographic area, or who require recent land use/land cover data to support their programs.

CCI has adopted methods and protocols developed by the Coastal Change Analysis Program (C-CAP) of the National Oceanic and Atmospheric Administration (NOAA) for classifying landcover using satellite imagery and image processing techniques. C-CAP has performed this activity previously using 1985 and 1989 satellite data for the Chesapeake Bay. Their protocols are well documented and tested, and include extensive ground-truthing before, during, and after the classification process. It is this level of field work that sets the CCAP technique apart from other agencies' classification methods. More than one thousand sites were visited throughout the scene in the field prior to the classification. Another 800 were occupied after the classification was complete.

The image processing software Imagine®, a product of Erdas, was used to classify the satellite image. The C-CAP

system identifies fourteen land cover classes. They are: high intensity developed, low intensity developed, cultivated lands, grass lands, deciduous forest, evergreen forest, mixed forest, scrub-shrub, palustrine forest, palustrine scrub-shrub, palustrine emergent, estuarine emergent, bare, and water.

Uses for land use/ land cover data are numerous. Land use data were the cornerstone of the water quality modeling just completed in Virginia to determined nutrient reduction goals for the various Tributary Strategies in Virginia. Land use/land cover data were used to develop the riparian forest buffer cover generated by the University of Pennsylvania for the Environmental Protection Agency, and now used to plan for forest restoration goals in Virginia. Habitat restoration targeting, and use conflict models being developed at CCI all integrate land use data.

The recent data set is available as an ArcInfo grid file through the Center for Coastal Resources Management Website at <http://www.vims.edu/ccrm/cci.html>. A metadata record is also included. This project was funded, in part, by the Virginia Coastal Resources Management Program at the Department of Environmental Quality through a grant with NOAA's Office of Ocean and Coastal Resource Management under the Coastal Zone Management Act of 1972, as amended.

Book Review

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change the fact that the fate of these islands was not in the hands of their inhabitants. The fate of these islands was, and is, to a large extent determined by nature. The chapter entitled "Cobb's Island" (1897) is one of the first narratives of shoreline migration, giving details about the formation of new inlets and the discovery of marsh peat on the seaward side of the island. In a succeeding chapter, Virginia Cardwell Eldredge writes about growing up on Little Cobb's Island in the early to mid 1900's. She returned to the island in 1982 for a visit and notes that her families' original house had "gone to sea." Furthermore, Tom Horton points out in his chapter, "The Ultimate Edge" (1987), it is "only when people try to anchor their condo-castles on these, earth's most dynamic land forms, that the barrier islands are said to be 'unstable,' and natural migration becomes an 'erosion problem.'" And as

Barnes and Truitt express in their introduction, "that man, so destructive and, ironically, helpless, has no permanent place on the barriers."

Those readers who are not familiar with Virginia's barrier islands might be surprised at the changes that have taken place there in the last three centuries. The book is a simple retelling of the history of the islands from the writers' personal perspectives; from the days when island living was full of hardships, through the easy times after the Civil War, until the present when humans are, again, the outsiders. Although it might appear after reading the editor's introduction that they are biased in favor of little to no human existence on the islands, most of the excerpts included have no overt philosophical or political bias. The historical accounts are so varied, yet so personal, they are assured to draw in the reader.

Wetland Denizens

Grass Shrimp

Paleomonetes pugio

by Walter I. Priest, III

Given their inconspicuous coloration and relatively small size, one might expect the grass shrimp to be one of the lesser noticed critters of the Chesapeake Bay environs. This is far from the case, however. Anyone who has retrieved an artifact or specimen from a bed of submerged aquatic vegetation (SAV) using a beach seine or pulled a minnow net through a flooded marsh gut, quickly realizes that any anonymity afforded by color or size is countered by the sheer numbers of grass shrimp present in these habitats. These numbers indicate how well grass shrimp have adapted to these shallow water communities and in so doing have become one of the classic examples of an organism able to exploit the detritus food web of tidal marshes as well as export this productivity to the whole estuarine system.

The Chesapeake Bay is home to three different species of the genus, *Paleomonetes*, collectively known as grass shrimp. *Paleomonetes vulgaris* is found in higher salinity waters and larger rivers. *P. intermedius* is the smallest of the three and uncommon in Virginia, and *P. pugio*, which is most commonly encountered in tidal marsh habitats, is the species we will primarily consider here. The three species have overlapping ranges and there is no way to readily distinguish among the species without a microscope.

Grass shrimp are decapod crustaceans closely related to the edible shrimp. They range in size from 40-50 mm with the females being slightly larger than the males. They have a pronounced beak on the front of the

carapace that has 8-11 teeth. *P. vulgaris* can be distinguished from the other species by two small teeth on the anterior edge of the carapace. The first two pairs of walking legs have pincers with the second pair being larger. Grass shrimp are thin and basically transparent with a few inconspicuous red, white, yellow and blue spots on the body. They range from the St. Lawrence River to the Yucatan Peninsula.

Grass shrimp are an annual species with few animals living longer than a year. They breed continuously from



spring to fall depending on water temperature and latitude. Eggs are carried in brood pouches on the abdomen of females. Each female can produce two broods per year with broods averaging 450 eggs each. Eggs hatch within the brood pouch and produce free-swimming larvae.

P. pugio shows a specific adaptation for life in highly organic marsh habitats that give it a competitive advantage over other species. Dissolved oxygen levels can vary widely in tidal marshes often reaching levels low enough to be lethal to some organisms. Under these conditions *P. pugio* has the ability to reduce its consumption of oxygen and survive where other species cannot.

Grass shrimp are surface deposit feeders where they consume small invertebrates such as nematode worms, copepods, amphipods, anemones and larvae of other organisms. They are also active consumers of plant detritus. It is here that they play an important role in the detritus food web. As they feed, they physically break up the larger pieces of leaves and stems. This fragmentation helps reduce the detritus particle size and provides a greater surface to volume ratio, which allows more effective colonization of the particles by bacteria, yeast, molds and other decay organisms. This helps increase the nutritional value and availability of the detritus to other detritivores.

Grass shrimp, in turn, are preyed upon by a myriad of predators including killifish, white perch, eels, blue crabs, striped bass and numerous others. These fish, particularly in their juvenile stages, regularly forage in the marshes and small tidal creeks during high tide. When they leave the relative safety of the marshes at low tide, they, in turn, are preyed upon larger fish in offshore waters. This export of biomass from the marsh to the estuary is made possible by the ability of grass shrimp to exploit the detritus food web and provide a source of food for the fishes which frequent tidal marsh habitats.

Grass shrimp, unlike their larger cousins, are not consumed directly by man. Indirectly however, they help make possible man's consumption of many species that feed on the small shrimp in the marsh and SAV environments.

Calendar of Upcoming Events

September 12-14	VIMS Wetlands Mitigation and Compensation Course For details and registration info contact Bill Roberts, wlr@vims.edu, (804) 684-7395 or Dawn at (804) 684-7380.
October 26 - 27	Virginia GIS 2000 Conference Richmond Marriott Hotel. For information visit www.institute.Virginia.edu/vapdc/gis2000.html or call Chris Gensic at the VAPDC, (804) 982-5538.
October 29-November 2	Wetlands Regulatory Workshop Holiday Inn on the Boardwalk, Atlantic City, NJ. For Info contact Ralph Spagnolo at EPA Region 3, (215)814-2718) or spagnolo.ralph@epa.gov
December 14 - 15	VIMS Winter Botany For more information contact Bill Roberts at wlr@vims.edu .
January 8-11, 2001	COASTAL GEOTOOLS, Coastal Resource Spacial Technology Tools Conference. Charleston, S.C. Contact: Steve Meador or Mark Jensen, (843) 740-1200, GeoTools@noaa.gov
July 15-19, 2001	Coastal Zone 2001. Hands Across the Water-Linking Land, Lake and Sea. Call for Papers. Abstracts due September 8, 2000. For more information, please call (843) 740-1279, or email Jan.Kucklick@noaa.gov

— Book Review —

Seashore Chronicles: Three Centuries of the Virginia Barrier Islands.

Edited by Brooks Miles Barnes and Barry R. Truitt.

The University Press of Virginia, Charlottesville, Virginia, 1997. 248 pp., \$30.00 (hardcover).

Review by Anne Newsom

These days, tourists to Virginia wanting vacations full of sun and surf head to Virginia Beach. But less than 100 years ago, tourists might have found themselves swimming in the Atlantic off of one of Virginia's many barrier islands. Prior to 1941, when the last inhabitants left the islands (except for Wallop's and Chincoteague Islands, which are still inhabited), many were thriving places of business as well as home to numerous Virginia families. During the last fifty years, however, the majority of the islands in Virginia's barrier system have been turned into nature preserves, owned by the Nature Conservancy or the state or federal government. The book, *Seashore Chronicles: Three Centuries of the Virginia Barrier Islands*, chronicles the history of these islands from past to present; from a time when they were first "discovered" by sailors until now, when humans rarely have the privilege to view the pristine islands along Virginia's coast.

The editors of the book, Brooks Barnes and Barry Truitt, include excerpts from other sources that focus primarily on human activities on the islands. It is from these accounts that the reader not only develops a feel for the social history of the islands, but also a view of the islands' natural history. The first excerpt, dated 1650, describes the hardships early sailors faced when trying to eke out an existence on an island. Weather, lack of food and shelter, and difficulty navigating the shoals offshore were primary problems early visitors faced.

Even as late as 1864, hardships on the islands could be formidable. In the chapter "We All Supposed Hog Island Was a Little Paradise" (1864), a Union soldier, stationed on Hog Island to guard the light house, found existence on the island miserable. He writes, "On the whole, I come to the conclusion that Hog Island would be a most excellent place to go away from!" Even after settlements were established on the islands, unpredictable weather, lack of resources and the changing landscape were sometimes daily obstacles that the settlers had to overcome to maintain an existence on the islands.

It was during the late 1800's to the early 1900's that island living became easier. This was primarily due to the expansion of the railroad down Virginia's Eastern Shore immediately after the end of the Civil War. Once the railroad was built and travel to the Eastern Shore and thus, to the islands, became easier, several islands become popular places for hunters and fishermen alike. One chapter, entitled "Trip to Cobb's Island" (1877), describes the little hotel on the island that attracted vacationers. Family members could enjoy activities such as hunting, swimming and fishing, and resources such as shellfish and game birds made for delicious eating.

Although many of the islands were thriving in the early part of the 20th century, no amount of economic fortune could

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