



# Wavelengths

Department of Ocean, Earth & Atmospheric Sciences  
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## Nutrients in Chesapeake Bay, what's all the fuss?

**Margaret A. Mulholland, Ph.D.**  
**Richard C. Zimmerman, Ph.D.**

Nutrient pollution from human activities is harming Chesapeake Bay. What most people don't fully understand is the extent to which excess nutrients are destroying valuable resources.

Just as cattle graze on grass and hay, all animals in the Bay ultimately depend on aquatic plants – algae and seagrasses – to provide food energy for growth. When the Bay is in balance, the right types of algae are present at levels needed to sustain the finfish and shellfish that we value. The result: oysters, crabs, menhaden, and everything else thrive along with healthy seagrass beds in clear water.

Human activities – food production, sewage disposal, and land use changes - have raised the concentrations of plant nutrients, particularly nitrogen and phosphorus, to unhealthy levels in the Chesapeake Bay and its watershed. In natural systems, these nutrients are in relatively short supply. So we add them to our cultivated crops and gardens to increase productivity and keep them healthy.

However, too much fertilizer can damage the plants we care about and promote the growth of pesky weeds, particularly in the absence of cultivation. That is how nutrient pollution has transformed the Chesapeake Bay: We now have a waterway dominated by weeds that threaten the viability of the resources we value.

These nutrients have caused explosive growth of algae in large blooms across the Bay. Decomposition of the dying algae consumes the water's oxygen supply, creating large dead zones, particularly in the smaller tributaries and main stem of the upper Bay. This lack of oxygen has been a red flag for environmental degradation and used by the environmental community to rally support for its cleanup efforts. More importantly, low oxygen is one of the unhealthy environmental endpoints that the Chesapeake Bay 2000 Agreement seeks to correct.

Some have argued that Virginia should do nothing about nutrient pollution because there are few problems with dead zones in the lower Bay and its tributaries that are well flushed by the tides.

However, this simple argument ignores many other problems caused by the Bay's algal weeds. Many of the algae that thrive under nutrient enriched conditions now routinely produce dense blooms in our estuaries, including the lower James River, and exert harmful effects on marine animals (including fish and shellfish) even when oxygen levels remain acceptable. Some of these algae are even toxic to humans. Putting high levels of nutrients in these waters is like adding fertilizer to a patch of poison ivy.

Second, transforming the Bay into a nutrient soup favors a few, fast growing algae that offer poor nutrition to critters that normally graze on a more diverse algal population. We are currently witnessing changes in the species composition of our algal communities, from one dominated by a healthy and diverse algal population to one increasingly dominated by a few potentially harmful or weed species. This is like switching the menu from a variety of healthy and balanced options to a diet of bread and water. And some critters can't make a living on that new menu.

Third, dense algal blooms block the penetration of sunlight through the water and thereby inhibit the survival of submerged aquatic plants such as seagrass. Submerged aquatic vegetation is a critical part of the Bay's habitat and key to the recovery of many commercially valuable fisheries. As long as we continue to fuel these algal blooms with excess nutrients, underwater grasses will not get the light they need to recover.

Nutrient-induced changes in the populations of these microscopic organisms lead to macroscopic problems that we identify with the declining environmental quality of the Bay, e.g., clear water, clean beaches and healthy fisheries. But the James River is far from healthy. Although the river frequently meets the required dissolved oxygen standards, it now supports some of the highest levels of algal biomass of 40 estuaries studied worldwide, and the diversity of algae is declining.

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# Getting past the smell

## Studying the linkages between phytoplankton, hydrogen sulfide and trace metal cycling

By Margaret Mulholland and Greg Cutter

Why would anyone want to study hydrogen sulfide, the smelly gas that most people associate with rotten eggs or mud flats? Actually, scientists are quite interested in this gas which is released by microscopic plants, or algae, called phytoplankton that live in the ocean's surface waters. The National Science Foundation (NSF) is funding such a study to find out how and why phytoplankton produce this stinky product.

It turns out that hydrogen sulfide reacts with many trace metals that can be essential (like iron or zinc) or toxic (like copper or mercury) to phytoplankton. These reactions can make trace metals unavailable to phytoplankton or even make them insoluble in seawater and cause them to precipitate. This not only affects the way some metals are cycled in the ocean, but also could be a way that phytoplankton affect and even control their chemical environment. Phytoplankton processes can also affect another gas, carbonyl sulfide, which is associated with the production of hydrogen sulfide. This gas affects the radiation balance of the planet by diffusing into the stratosphere and producing particles that block radiative energy from reaching the Earth's surface.

Our research seeks to determine whether hydrogen sulfide production by phytoplankton in the surface ocean is a significant factor in trace metal cycling and in the planetary sulfur cycle. We are conducting laboratory experiments and fieldwork to test more specific hypotheses. In the laboratory, phytoplankton can be grown under controlled conditions to determine which species of these algae can produce hydrogen sulfide. This work provides a "yardstick" with which field results in the real world can be interpreted.

During laboratory studies to date, phytoplankton from almost all taxonomic groups found in the ocean produce H<sub>2</sub>S (hydrogen sulfide) to some extent. These include species that occur in the Chesapeake Bay, where there is a broad range of nutrient and trace metal concentrations, and the open ocean, where nutrients and trace metals are often at the limits of analytical detection and where they are thought to limit biological productivity, or growth. In general, the lab results show that the smallest of the small phytoplankton, the "blue-green algae," or cyanobacteria, produce the most, while the diatoms that make skeletons out of biogenic silica (also known as opal) and are 100 times as large as the cyanobacteria, produce the least. Adding more metals such as zinc to the culture solutions also increases the relative amounts of hydrogen sulfide produced.

### Laboratories at Sea



*Our March 2004 cruise in the Sargasso Sea was extremely rough (for perspective, the CTD rosette is ca. 1.8 m high).*

To put these lab results in context, we conducted two major field expeditions during contrasting seasons, August 2003 and March 2004. Both trips followed the same route, leaving Norfolk to sample waters at the edge of the continental shelf where nutrients, phytoplankton and trace metals are abundant. Our science team then traveled out into the Sargasso Sea (western North Atlantic) near Bermuda, where there are low nutrient, trace metal and phytoplankton concentrations for a temperate open ocean station. Finally, we transected approximately 1,500 miles southeast (800 miles east of Barbados) and repeated sampling experiments in warmer subtropical and tropical seas where the types and species of phytoplankton are different, but where nutrient, trace metal and phytoplankton concentrations remain low.

Measurements were made in the uppermost portion of the water column (to 500 meters), where phytoplankton are abundant, and the concentrations and distributions of metals, hydrogen and carbonyl sulfide, and phytoplankton species in these waters were determined. In addition to this work, water was collected and used for incubation experiments to measure the rates of, and factors controlling, hydrogen

sulfide production by the natural resident phytoplankton. In these shipboard incubation experiments, hydrogen sulfide production was monitored over time, along with the abundance of particular phytoplankton species.

During August 2003, we used the R/V Cape Hatteras, a member of the NSF research fleet and operated by Duke University and the University of North Carolina, for our fieldwork. We had 12 scientists aboard from Old Dominion University (graduate students, technicians and three faculty)

*getting past the smell cont.....*

and the University of Maryland (graduate student, postdoctoral researcher and a faculty member). We focused on obtaining data on the concentrations of trace metals and hydrogen sulfide in the water column and their interactions. Although John Donat, ODU associate professor of chemistry and biochemistry, is still analyzing the collected trace metals in his lab at the university, one interesting on-board finding was that hydrogen sulfide and mercury strongly interact, and much of the dissolved mercury in the Sargasso Sea appears to be complexed, or bound, by hydrogen sulfide, which affects its cycling and even toxicity.

Other “highlights” of the August expedition were the two major hurricanes we had to avoid. One was Fabian, which caused us two days of lost ship time and went on to inflict substantial damage to Bermuda. The other “missed” hurricane on our way south was Isabel, which hit Norfolk after we returned.

### **Research Team Tries Something New**

In March 2004, we went out on the R/V Endeavor, another NSF research vessel, operated by the University of Rhode Island. This time, graduate students from the University of Southern California and Scripps Institution of Oceanography joined our group. While no hurricanes bothered us, strong winter storms whipped the seas, making work aboard the ship challenging. The scientific focus of this trip was on performing field incubations of resident phytoplankton to determine the rates of hydrogen sulfide production and to examine the effects of trace metal additions. The Cutter group also brought along a newly developed automatic system to measure hydrogen sulfide concentrations in the surface ocean every 25 minutes, something never before attempted because it requires a group of analysts working in shifts to cover 24 hours a day for days at a time. Such a “time series” allows the integration of all the processes producing and removing hydrogen sulfide to be observed, which cannot be easily duplicated in the laboratory on land.



*The scientific party for our 2004 cruise from Norfolk to the Sargasso Sea off Bermuda and into Barbados.*

In the ocean waters east of Barbados, we found that hydrogen sulfide concentrations were maximal in the early morning after sunrise, but then decreased through the day and into the night. This is consistent with production by phytoplankton as part of photosynthesis (which requires energy from sunlight).

### **Hydrogen Sulfide’s Role in Our Changing Global Climate**

The field incubation work obtained data that are spurring new efforts for the Old Dominion lab studies. Surprisingly, the phytoplankton that produced the most hydrogen sulfide in the field were the larger diatoms and not the very small cyanobacteria – exactly the opposite of previous lab results. Furthermore, the addition of metals seemed to have little effect on phytoplankton growth and their production of hydrogen sulfide. This is consistent with what has been found by other researchers working in the North Atlantic (i.e., metal additions do not stimulate the growth of larger phytoplankton), but its relevance to the hydrogen sulfide-phytoplankton connection will have to remain a puzzle for the moment. Nevertheless, further laboratory experiments are being done to confirm that these species produce hydrogen sulfide in a controlled, unialgal, laboratory setting.

Why is this important? As noted, hydrogen sulfide can play an important role in trace metal availability in the oceans, and as such, act as an intermediary between the phytoplankton producing it and the trace metals affecting them (pro and con) in their aquatic habitat. In our changing global climate, we are already observing changes in algal species distributions in the coastal and open oceans around the world as a result of man-made nutrient and trace metal inputs. Changes in ocean temperature and pH (acidity from atmospheric carbon dioxide entering surface seawater) will also elicit changes in species composition and the resultant cycling of bioreactive elements in the sea. Hydrogen sulfide will have a role in these global changes, ameliorating some effects, while exacerbating others.

## Chesapeake Bay Governor's School–Warsaw Campus Captures High School Marine Science Competition in Dramatic Overtime Finish

In a cliffhanger race that ran into overtime, the Chesapeake Bay Governor's School, Warsaw Campus, emerged the champion in the Blue Crab Bowl, held Feb. 12, 2005 at the Virginia Institute of Marine Science campus at Gloucester Point, VA.

The Blue Crab Bowl is a Virginia regional academic tournament focusing on ocean science. Eighty students from 15 high schools statewide spent the day in heated competition. The winning team goes on to compete against 24 other regional champions in the 8<sup>th</sup> Annual National Ocean Sciences Bowl (NOSB®) to be held April 23 - 25 in Biloxi, Mississippi.

The round-robin, double elimination contest used questions designed by marine scientists to test the students' knowledge of oceanography, geology, biology, and maritime history. Guided by their teacher coaches, the Bowl not only helps students broaden their awareness and understanding of the oceans, it provides a forum for students who excel in math and science to receive regional and national recognition for their diligence and talent.

This event is a cooperative effort between the Department of Ocean, Earth, and Atmospheric Sciences and the Center for Coastal Physical Oceanography, Old Dominion University, and the Virginia Sea Grant Marine Advisory Program at the Virginia Institute of Marine Science, College of William and Mary. More than 60 faculty, staff and graduate students from both institutions donated many hours of their time to ensure the success of this exciting event.

Virginia's teams came from all corners of the state — from Fredericksburg to Virginia Beach, Alleghany County in the west to Exmore on the Eastern Shore. The winning team from Tappahannock landed an all-expense-paid trip to the national competition. This April in Biloxi, they will represent Virginia in the 8<sup>th</sup> National Ocean Sciences Bowl, going up against 24 other teams. An expected 2,000 students will represent 375 high schools from around the country.

During Saturday's event, the competition progressed quickly from easy marine science questions to difficult problems in physical oceanography and geology, as well as challenges in scientific deduction. Of the 16 participating teams, four emerged as top contenders by late afternoon.

It was a nail-biter for the science set. Chesapeake Bay Governor's School, Warsaw played back-to-back competitions, both requiring overtime tie-breaking questions in order to take the laurels. Hot on their heels in Second Place was Bishop Sullivan Catholic High School of Virginia. Third Place went to Maury High School of Norfolk, and Fauquier High School in Warrenton held Fourth Place. The awards were presented by Dr. Cynthia Suchman, Assistant Director of Virginia Sea Grant, the agency funding the uniquely-crafted ceramic "crab bowls."

The National Ocean Sciences Bowl® is a program of the Consortium for Oceanographic Research & Education (CORE) and is funded through the National Oceanographic Partnership Program (NOPP), a collaboration of 15 federal agencies. Its purpose is to encourage and support the next generation of marine scientists, policy makers, teachers, explorers, researchers, technicians, environmental advocates and informed citizens. The National Ocean Sciences Bowl is a collaborative effort between the Consortium for Oceanographic Research and Education (CORE) and the National Marine Educators Association (NMEA).

Local sponsors of the regional Blue Crab Bowl include Virginia Sea Grant, ODU's Center for Coastal Physical Oceanography, the Mid Atlantic Marine Education Association, The Old Point National Bank, Chesapeake Bay National Estuarine Research Reserve in Virginia, Virginia Marine Science Museum, Hood College, Subway and Pizza Hut.

For further information, please contact Elizabeth Smith via phone at 757-683-5567, e-mail [exsmith@odu.edu](mailto:exsmith@odu.edu) or check the Blue Crab Bowl web site at <http://www.vims.edu/bcb>. For information on other competitions around the country and the National Ocean Science Bowl visit <http://core.cast.msstate.edu/nosb.html>.



*The winning Governor's School team was coached by Kevin Goff, and members were as follows:*  
*\*Captain Abby Huges, Rappahannock High school, Callao - grade 11*  
*\*Katie Shrader, Lancaster HS, Belle Isle - grade 12*  
*\*Jason Lake, Northumberland High School, Kilmarnock - grade 11*  
*\*Tony Vitali, Rappahannock High School, Warsaw - 12*  
*\*Chris Kinny, Gloucester High School, Gloucester - grade 11*



## CHAIR'S MESSAGE

This spring produced a flurry of good news and some causes for concern about the future of ocean science at ODU, and across the nation. First, the good news. Our faculty continues to win highly competitive research awards from the most prestigious funding agencies, including the National Science Foundation, National Aeronautics and Space Administration and the National Oceanic and Atmospheric Administration. These funds support the research activities of our faculty and provide training opportunities for our Ph.D., M.S. and undergraduate students that are published in the most prestigious academic journals, including *Science*.

More good news. **Dr. Cynthia Jones** was named the 2004 Virginia Professor of the Year by the Carnegie Foundation and the 2005 Virginia Professor of the Year by the State Council of Higher Education for Virginia. Her accomplishments are detailed in the pages of this issue. Our graduate students continue to complete their degree programs at a good pace, including 4 newly minted Ph.D.s in Oceanography this year, and move into productive jobs as professional scientists,. **Dr. Gregory Cutter** led the first capstone course sequence for our first crop of senior undergraduates this year, and it has been a resounding success. This 2-semester course provides our students a unique hands-on opportunity to apply the theories learned in their previous coursework to a real research problem. The results of this first year's effort will be presented by the students during the ODU Research Day scheduled for April 6, 2005.

Now for the bad news. The New Year saw a sobering message delivered to the scientific community. Federal support for science in general, and ocean research in particular, is likely to be flat, at best, for the next several years. Clearly, achieving the goal of transforming ODU into a top-ranked research university will prove to be a greater challenge than ever before. How will we meet this challenge?

ODU is preparing to launch new maritime initiative that will involve new opportunities for research collaboration among faculty and students in OEAS and other departments across ODU. The centerpiece of this new initiative focuses on the procurement of a federal appropriation to establish the Virginia Coastal Ocean Observing System (VCOOS), that will become part of the emerging national Integrated Ocean Observing System. VCOOS will help to develop a greater understanding of coastal ocean currents, wind waves, water quality and marine resources of the mid Atlantic region, and especially the lower Chesapeake Bay. VCOOS will also provide infrastructure and research opportunities to train a new generation of operational oceanographers for a job market that is poised for significant growth.

Even though OEAS continues to move forward, we take an opportunity in this issue to look back to the 'good old days' through the reminiscence provided by our alumnus, **Gerardo Perillo**. The message in his story is that the names, and even our physical location may change over time, but the spirit and enthusiasm of our faculty and students provides a continuity of culture for OEAS across generations of students and faculty.

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### *nutrients in chesapeake bay, what's all the fuss? cont.....*

The need to reduce nutrient pollution for the health of the Bay and the health of the James River is urgent. This cleanup won't be cheap, but we can do it.

In Virginia, the largest source of nutrient loading to the Chesapeake Bay and its tributaries comes from point sources - sewage treatment plants and industrial facilities. The technology exists to make significant reductions in nutrient outflows from these facilities. Implementation costs money, but proposals are on the table to fund these efforts.

Reducing nutrient releases from point sources won't solve the whole problem, but they are a start. Because nutrients emitted from point sources generally come out the end of a pipe from factories and sewage treatment plants, they are easier to regulate than more diffuse sources such as stormwater or irrigation runoff and atmospheric deposition. Efforts to abate point source nutrient loading from around the country have significantly improved water quality in some of the Nation's waterways. We can even point to successful examples implemented by our neighbors in Maryland and North Carolina.

In our efforts to clean up Chesapeake Bay, solving the problem of point source nutrient pollution is low-hanging fruit. Let's pick it.

*Dr. Mulholland is Assistant Professor in the Department of Ocean, Earth and Atmospheric Sciences at Old Dominion University. Dr. Zimmerman is Professor and Chair of the Department of Ocean, Earth and Atmospheric Sciences at Old Dominion University.*

# ALUMNI NEWS

## Remembering Room 120

by

**Gerardo M. E. Perillo, Ph.D.**  
Alumnus- 1981

December 31 marked 25 years since the day my wife **Cintia Piccolo** (alumnus 1981) and I arrived for the first time to Norfolk. That was also our first trip abroad. I remember waiting at the airport for Ron Johnson to come pick us up, we were going to stay at his home until we were able to get settled. Ron never received our letter with our arrival date, therefore he was not there to greet us. We tried to manage with our extremely poor English (good enough to get through the TOEFL but not to handle Norfolk's accent in our first foreign "adventure") and little travel experience, we managed to find a very cheap hotel downtown. Ron came to see us and we spent New Years Eve at Robbie and Ron's home and, from then on, they became our very best friends.

We arrived at room 120, the Physical Oceanography Lab of the old Institute of Oceanography on 47th Street about a couple of days before the fall 1979. Ron assigned us a couple of adjacent desks in an already packed lab (Fig. 1).



*Fig. 1 Gerardo at his normally clumsy desk ca 1981 (it is like that even today).*

I distinctly remember our first class, the core course Physical Oceanography II with Ron Johnson. Even though we had lived at his house for almost 15 days, we did not understand anything he said. That was when we decided to buy a tape recorder. Our understanding in George Oertel's class, Geological Oceanography, was no better, but he let us record him too. Jack Ludwick, who became my dissertation director and a very good friend, did not let me record his Beaches and Shallow Water Processes I. Nevertheless, after a few weeks of listening to our tapes and watching TV, we mentally switched from translating everything into Spanish to start thinking in English. A major change in our lives as we no longer went to bed with headaches.

My memory goes to our friends with whom we shared room 120 for 3 years. For instance, Dick Phillips trying to put together the Digital PDP 8 and the rotary calibration tank for his once in a life time experiment. Gosh, it took us (Im Sang Oh was also part of it) a couple of nights to go through the turbulent measurements over a rippled bed (Fig. 2) and a whole week to be able to find a way to make the Apple II micro, where we stored the data, actually connect to the monstrous Digital DEC 10 mainframe at the other side of Hampton Blvd.



*Fig. 2 DickPhillips trying to program the PDP 8 (the Apple II was on top) while Im Sang Oh and I looked at the experiment design.*

Greg Kopanski was great in getting very cheap coffee and sugar from the Naval Station store so Cintia was able to run the coffee pot. After a while, the coffee pot became a kind of tradition in the Institute as everybody was coming into the room for coffee and staying for long scientific and philosophical discussions. The most active and often visitor was Chet Grosch.

The proceeds of the coffee pot were put to good use to finance the parties we held in room 120 for any student who passed his/her MS Thesis or PhD Dissertation defense. Everything started when the first of our room graduated, Fred Hilder. I remember going with Greg and Cintia to buy a cake and some wine to celebrate. The parties became an event and when Cintia got her PhD in Physical Oceanography in December 1981 (Fig. 3), perhaps the first woman ever to have a PhD at ODU. Beth Hester and Laura Juggan prepared empanadas (a traditional Argentinean food. They were calling me every five minutes from Beth's apartment to ask me for advice on the recipe. The empanadas were great anyway. However, the best honor she had was that all oceanography faculty and students that assisted to her defense were all dressed up.



*Fig. 3 Cintia cutting the cake at her graduation party after most of the people took out their ties and champagne was running out.*

## SELECTED

*PUBLICATIONS*

*GRANTS/CONTRACTS*

*PRESENTATIONS*

### Publications

Drake, L.A., and **F.C. Dobbs**. 2005. Do viruses affect the fecundity and survival of the copepod *Acartia tonsa* Dana? *J. Plankt. Res.* 27(2): 167-174.

Hung, C.\_C., **G. T. F. Wong** and W.M. Dunstan. 2005. Iodate reduction activity in nitrate reductase extracts from marine phytoplankton. *Bulletin of Marine Science*, 76: 61-72.

### Grants/Contracts

Pilot program: designing an interactive interface for numerical models of oceans and estuaries., **Klinck, J.**, Commonwealth of Virginia, Governors Office, 8/05-6/05, \$150,000.

Blue crab reproduction: Changes in age and size at maturity and size fecundity relationships in a reduced population., **McConaugha, J.**, Sea Grant, 2/05-1/07, \$95,452.

How do changes in physical conditions and megalopae behavior affect blue crab recruitment variability in Chesapeake Bay and Delaware Bay?, **Valle-Levinson, A.**, Sea Grant, 2/05-2/07, \$106,221.

### Presentations

2005 **Burdige, D.J.** Carbonate Dissolution and Reprecipitation. Invited presentation-Goldschmidt Conference, Tulane University.

2005 **Mulholland, M.** Significant Processes Observations, and Transformation in Oceanic Nitrogen (SPOT-ON). Baltic Sea Research I Institute in Rostock-Warnemunde, Germany.

2005 **Royer, T.C.** Alaskan Oceanography; Past, Present and Future, A Personal Perspective. Keynot Talk at Alaska Marine Science Symposium, Anchorage, Alaska.

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#### *Remembering room 120 cont.....*

The long nights we spent playing GO with Im Sang as we were letting the DEC 10 run out Cintia's and Im Sang's models and my FFTs which many times ended in several meters of plot paper. We had to work after midnight because that was the time the Computer Center gave us 128 Kb of RAM to run the programs. Obviously we only had a Tektronik green monitor and a teletype to work in the common computer room of the Institute. Eventually, Fred Hecker built one black and white monitor from a development kit and installed a modem into room 120.

Printouts had to be recovered from the Computer Center in large green sheets and the Computer Center guys only allowed us to use white paper printouts for final outputs. The early morning (4:00 a.m-5:00 a.m) trips to the Computer Center were always easier when room 120's gang would head for the bakery next door for fresh, warm doughnuts that we enjoyed with the last coffee pot of the day (or night???)

Now, Cintia being the Director and I the Vice Director of our own Institute, the Instituto Argentino de Oceanografía (IADO) which is the only research organism that covers all disciplines of Oceanography in Argentina, we found out that many of the principles we apply here were learned during those three years in the Institute of Oceanography. The family-like environment we had with most of the professors (many times just sticking our heads in Jack's or Chet's open offices was enough strike up a conversation) and our fellow grads. We try to instill the same idea at IADO. We also have our own versions of room 120 for our PhD students and we try to favor the free exchange of ideas and broad discussion on anybody's problem. These discussions lead all of us to make major advances in our research that could not have been possible if everybody was sitting behind his/her own shell (desk).

Room 120 was the seed of that, and I was very disappointed when I returned to ODU in 1985 and found out that it was dismantled right after we left. Maybe those that shared with us room 120 will read this and may be able to remember the good times we had in those days.

# Virginia Professor of the Year

The Carnegie Foundation honored **Cynthia Jones**, professor of ocean, earth and atmospheric sciences, November 17 as the 2004 Virginia Professor of the Year for the Advancement of Teaching and the Council for Advancement and Support of Education (CASE) during a ceremony in Washington, D.C.

She joins Karen Polonko, professor of sociology and criminal justice, and Robert Lee Kernell, professor emeritus of physics, as the third ODU faculty member to receive this honor.

“Dr. Jones is a scholar of national reputation and representative of the outstanding faculty we have throughout the commonwealth of Virginia,” said Gov. Mark R. Warner. “As the 2003 Virginia Scientist of the Year, Dr. Jones and her research contributions and teaching excellence at Old Dominion University are well known to me. She is an invaluable member of the academic community.”

The purpose of the awards program is to recognize the most outstanding undergraduate instructors in the country. This year there were winners in 47 states chosen from a group of nearly 400 of the nation’s top professors.

Jones, an eminent scholar and director of the Center for Quantitative Fisheries Ecology, joined Old Dominion in 1986. In addition to teaching and advising students in five courses, she is an international pioneer in fisheries ecology. She developed new techniques to accurately determine the age of fish by studying their ear bones, or otoliths, which have daily and annual rings similar to trees. She also pioneered a chemical analysis technique that can determine where a particular fish was hatched and what waters it has inhabited since. Because of her work, scientists can now identify essential fish habitats and determine which ones provide better living conditions.

A Fulbright scholar, Jones is a member of the Virginia Marine Resources Commission, and the first fisheries scientist to serve on the commission in its 125-history. Gov. Warner named her one of Virginia’s Outstanding Scientists of 2003. She recently received a nearly \$200,000 Virginia Sea Grant to work on a project titled “How Essential Fish Habitat Influences Population Structure for Spotted Seatrout, *Cynoscion nebulosus*, with Special Emphasis on Chesapeake Bay.”

CASE established the Professor of the Year program in 1981 and the Carnegie Foundation became a co-sponsor a year later.

*QUEST, Winter 2005*

## Another Achievement for Cynthia Jones, Ph.D.

For the third time since the recognition program was begun in 1990, Old Dominion University has had two SCHEV award winners in the same year.

**Cynthia M. Jones** and Katharine C. Kersey are among a select group of 12 statewide winners of the 2005 Outstanding Faculty awards from the State Council of Higher Education for Virginia. Each of this year’s winners, honored with a luncheon in Richmond, received a cash award of \$5,000 from the Dominion Foundation. To date, ODU has produced 17 winners in the highly competitive program.

Jones, who directs ODU’s Center for Quantitative Fisheries Ecology, joined the university in 1986. In addition to teaching and advising students in five courses, she is an international pioneer in fisheries ecology. She developed new techniques to accurately determine the age of fish by studying their ear bones, or otoliths, which have daily and annual rings similar to trees. She also pioneered a chemical analysis technique that can determine where a particular fish was hatched and what waters it has inhabited since. Because of her work, scientists can now identify essential fish habitats and determine which ones provide better living conditions.

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In a letter of support for her SCHEV award nomination, a graduate student said of Jones, “She has the ability to present complex concepts in a format that is both understandable and relevant to real-world applications.” He added, “However, it was my empowerment to investigate the nth degree processes that piqued my interest, accompanied by a ‘stay focused’ support base, that I found most extraordinary about Dr. Jones’ teaching style.”