

Winter 1994

# Circulation, Winter 1994

Center for Coastal Physical Oceanography, Old Dominion University

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# CCPO Circulation, Winter 1994

## HYDROGRAPHIC OBSERVATIONS IN THE CHESAPEAKE BAY MOUTH

The Chesapeake Bay is the largest estuary in the United States and a highly productive ecosystem. It represents the habitat, the spawning haven, and the nursery grounds for many organisms of ecological and economic significance. The region of the Chesapeake Bay mouth (CBM) is of particular interest since it is where the waters from the adjacent coastal ocean exchange with those of the Bay. This exchange determines the transport and fate of dissolved and suspended matter in and out of Chesapeake Bay. One of the research activities that CCPO has focused on since its inception has been the study of this region. CCPO researchers, LARRY ATKINSON, JERRY MILLER, and ARNOLDO VALLE-LEVINSON, are conducting studies to advance our understanding of CBM dynamics.

Several types of surveying programs are presently being undertaken. The first begun in April 1992, consists of monthly transects across the CBM to determine the density field based on temperature and salinity profiles measured with a Conductivity, Temperature and Depth (CTD) instrument at 18 locations. The stations are spaced one mile apart. This monthly transect runs parallel to the Chesapeake Bay Bridge-Tunnel (CBBT) (see figure). These data are collected on the highest spring tide each month, and plans call for continuing this effort indefinitely. The objectives of the study are to determine the lateral structure of the temperature and salinity fields and to describe the intra-annual, seasonal, and interannual variability of such lateral structure as it relates to atmospheric, oceanic, and fivefine forcing. Another program consists of local current and temperature measurements using current meters. Such time-series measurements have been carried out at two sites during the summer (July 21-September 13, 1993) (see figure). Each mooring was deployed over a depth of approximately 10 meters with instruments placed about 3 meters away from the surface and the bottom. The goals of this program are to describe the intratidal and tidal monthly variability of the flow at different sites across the CBM and to relate such variability to wind-induced forcing and astronomical (tidal) forcing. Some aspects of vertical stratification of the water column can also be described with the temperature records. This activity will continue next spring with the redeployment of these moorings. In the future, more instruments should be deployed for better resolution of the lateral structure of the flow in this region.

A recent activity also included water velocity measurements combined with temperature and salinity observations along a CBM transect (see figure). This survey was carried out, jointly with researchers from SUNY at Stony Brook, on October 6-7, 1993. It involved the use of an Acoustic Doppler Current Profiler (ADCP) to obtain fine vertical and horizontal resolution of the velocity structure. Its objective was to determine the intratidal and the residual water transport across the section. Future efforts along these lines shall involve cooperation with other institutions of the region, such as the Virginia Institute of the region, such as the Virginia Institute of the region, such as the Virginia Institute of Marine Science of the College of William and Mary and the Horn Point Laboratories of the University of Maryland.

## The Oceanography Magazine

LARRY ATKINSON and Connie Sancetta recently became the new managing-editor and editor, respectively, of the *Oceanography* magazine published by The Oceanography Society (TOS). Their first issue as the new editors was published in October. Connie is on leave from Lamont-Doherty Earth Observatory to the Ocean Sciences Division of the National Science Foundation, where she is a program manager. Larry has had much experience in running a scientific publication, as he recently completed his tenure as senior editor of the *Journal of Geophysical Research-Oceans*. ANNE WEST-VALLE, CCPO outreach coordinator, is the editorial assistant of *Oceanography*. Anyone interested in obtaining information on publishing in *Oceanography* should contact Anne at (804) 683-5558 or internet: [anne@ccpo.odu.edu](mailto:anne@ccpo.odu.edu).

## CRC Visits CCPO

ODU provost JoAnn Gora hosted the 92nd meeting of the Chesapeake Research Consortium (CRC) Board of Trustees Meeting on October 25, 1993 at Crittenton Hall. EILEEN HOFMANN, CCPO associate professor, was the guest speaker at the meeting. Eileen's talk centered around ongoing research at CCPO on the Chesapeake Bay and her Antarctic research program, which has a coastal focus. LARRY ATKINSON is an institutional trustee member of CRC. The CRC promotes collaborative research on the environmental problems.

## General Information

ADK'S "WORDS OF WISDOM"

Carl Rossby's definition of science: The replacement of big errors by lesser errors.

Congratulations to Anne West-Vallo and Arnoldo Valle-Levinson on the 10/31/93 birth of their son, Emillane W. Valle. Anne is the outreach coordinator for CCPO and Arnoldo is a research assistant professor.

Birthday wishes to Denny Kirwan! Denny turned the distinguished age of 60 on November 29, 1993. Denny is pictured getting ready to dig into his birthday cake during a small celebration at CCPO.

## Just the facts...

### Grants/Contracts Awarded

G. T. CSANADY, "Air-sea coupling in the North Atlantic," \$61,620, National Oceanic and Atmospheric Administration.

### Appointments

LARRY ATKINSON, three-year term on the CoOP Steering Committee.

G. T. CSANADY, U.S. editor of *Journal of Oceanography*, a scientific journal published by the Japanese Oceanography Society.

MARGARET DEKSHENIEKS, student representative of the 33rd National Shellfisheries Association (NSA). Margaret will be responsible for planning student receptions and assist with student job/resume database that is accessed by NSA as well as potential employers.

A. D. KIRWAN, JR., four-year term as editor of *Nonlinear Processes in Geophysics*, a scientific journal published by the European Geophysical Society.

### Presentations

LARRY P. ATKINSON and ANNE WEST-VALLE, "The Oceanography Forum on Learning Link: A Source of Tidal/Meteorological Data," The Ninth Annual Technology in Education Conference, Bethel High School Hampton, Virginia, November 20, 1993

A.D. KIRWAN, JR., "Chaos and predictability in meteorology and oceanography," meeting of the local chapter of the American Meteorological Society, Norfolk, Virginia, November 17, 1993.

JERRY MILLER, "Hydrographic variability in lower Chesapeake Bay and on the adjacent continental shelf," Mid-Atlantic Bight Physical Oceanography and Meteorology (MABPOM) Meeting, North Carolina State University, Raleigh, North Carolina, November 5-6, 1993.

YVETTE SPITZ, "Feasibility study of dynamic assimilation of tide gauge data in an enclosed basin," The International Summer School in La Garde, France, August 2-27, 1993. Yvette was awarded a \$2,000 grant by NSF to participate.

ARNOLDO VALLE-LEVINSON, "Mechanisms affecting water exchange in eastern Long Island Sound," University of Connecticut, Groton, Connecticut, December 3, 1993.

ARNOLDO VALLE-LEVINSON, "Flow observations in the lower Chesapeake Bay," poster session at the 1993 AGU Fall Meeting, San Francisco, California, December 8, 1993.

## Publications

A. D. KIRWAN, JR. and B. L. LIPPHARDT, JR., "Coherent flows with near zero potential vorticity," *J. Mar. Syst.*, 4:95-115 August 16, 1993.

JOHN M. KLINCK and DAVID A. SMITH "Effect of wind changes during the last glacial maximum on the circulation in the southern ocean," *Paleoceanography*, Vol. 8, No. 4, 427-433, August 1993.

## Graduates

Ph.D.: ANDRAS KAPOLNAI, dissertation titled, "Heat Storage and Transport Processes in the Tropical Atlantic Ocean," December 1993. Advisor: G.T. Csanady. To UNC.

M.S.: SANG-KI LEE, thesis title, "Instability waves in the Gulf Stream front and its thermocline layer," December 1993. Advisor: Chester Grosch. CCPO for Ph.D.

## Visiting Scientist Lecture Series

During the academic year, CCPO invites several distinguished scientists to present seminars on general coastal oceanography topics. The lectures take place in Room 109, Crittenton Hall, Old Dominion University, on Mondays at 3:30 p.m. EILEEN HOFMANN, associate professor, coordinates the lecture series, with the assistance of BEVERLY MITCHELL. Below is a schedule of lectures for the 1993 fall semester. Please contact Beverly at (804) 683-4945 for more information or if you would like to be on the mailing list for announcements. Lecture topics are announced one week prior to each lecture.

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| January 24<br>Benoit Cushman-Roisin,<br>Dartmouth                    | March 14<br>John Klinck, CCPO           |
| January 31<br>John Boon, VIMS  | March 21<br>Sirpa Hakkinen<br>NASA/GSFC |
| February 7<br>Julio Moraga-Opazo,<br>u. catolica del Notre,<br>Chile | March 28<br>Richard Mied, NRL           |
| February 14<br>David Burdige, ODU                                    | April 4<br>Arnoldo Valle-Levinson, CCPO |
| February 28<br>Carole Seyfrit<br>Sociology Dept., ODU                | April 11<br>Dan Lynch, Dartmouth        |
|  | April 18<br>Ken Brink, WHOI             |

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