Water for Life: Celebrating 20 Years of Research, Education and Public Service in the District of Columbia

Water Resources Research Center
University of the District of Columbia
March 1994
Water for Life: Celebrating 20 Years of Research, Education and Public Service in the District of Columbia

DC Water Resources Research Center
20th Anniversary

1973-1993

DC Water Resources Research Center
University of the District of Columbia

Washington, D.C.
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PREFACE

On the occasion of its 20th anniversary, the DC Water Resources Research Center (DC WRRC) is pleased to present this document commemorating its achievements in water resources research, technology transfer, training, and outreach. A special chapter is dedicated to the 20th anniversary commemoration activities that were organized in conjunction with the National Geographic Freshwater Week, November 8-17, 1993, and that successfully illustrated the Center's mission and accomplishments.

Over the years, the Center's principal investigators have performed quality and innovative work, and have been active in transferring their research results and in advocating necessary changes. Their names and the titles of their projects are listed in this document. Indeed, the goal of our research has been to develop technology that advances human experience. Managing a research institution does not mean creating an ivory tower elite, but working with and through human beings. Well before the term "diversity" became popular, the Center was far ahead in recognizing the necessity of integrating cultural behaviors with technical knowledge. The Center has recruited staff from all continents, from all races and creeds. The dominant theme has been working in harmony with a diverse group of people. Balancing multi-disciplinary fields with multi-cultural experiences has been a true success of the DC WRRC. Water doesn't know any boundaries. It permeates all fields; it touches all mediums. It just makes sense that people promoting it and working at it take on a broad spirit of harmony within the diversity.

Some of the Center's activities go beyond its mandated mission. Prominent among these are the public and youth outreach programs. One of the most important roles of the DC WRRC in this area is to educate and significantly increase the participation of minorities in the essential field of water resources.

In the 20 years of its existence, the Center has received support from many offices and individuals inside and outside the University. At its inception, the Center was part of the Washington Technical Institute, a predecessor institution of the University of the District of Columbia (UDC). Subsequently, when UDC was formed, the Center was consolidated into the College of Life Sciences and is now associated with the Division of Research, Training and International Programs. In its day to day management, the Center has received constant and enlightened support from various University agencies: Arthur "Doc" Danner and staff in the Office of Finance; 7oso Barnes and staff in the Grants Office, Ross Spach and staff in the Procurement Office; the Accounts Payable Office, Charles Green and staff; as well as the Offices of Administrative Services, Payroll, Personnel, Reproduction, and the Warehouse. In the early beginnings, the late Dr. Annye Buck was instrumental in the growth of the Center. All successive deans and acting deans of the College of Life Sciences, i.e. J. Jones, W. Hyman and L. Elder have been very supportive of our program.
We are very grateful to the many funding agencies which have contributed financially to the growth of the Center. These agencies have also provided us with advisory and technical support. They include the US Geological Survey (USGS), The DC Department of Consumer and Regulatory Affairs and the DC Department of Public Works, the US Environmental Protection Agency, the Interstate Commission on the Potomac River Basin, the Metropolitan Council of Governments, the US Army Corps of Engineers, the National Park Services, the National Science Foundation, the Chesapeake Bay Program, and the DC Public Schools. We have enjoyed the cooperation of the network of the National Institutes on Water Resources and the local universities: Howard University, Catholic University, American University, George Washington University, Georgetown University, and the University of Maryland.

The Center has benefited over the years from the experience and advice of other water institute directors and of the USGS staff. We also have enjoyed the excellent work of the former directors of the DC WRRC. They have fought for the creation and the solid place of the Water Center in the University of D. C. and the nation. We hereby express our gratitude and hope for continued cooperation in the future.

Critical as it is to human survival, water can be a blessing when it is used to provide for the essential needs of humans; and a burden when it is misused and polluted. The Center's role has been, and will continue to be a focal point in the effort to preserve this essential resource: by remaining the key knowledge broker, uncovering problems and solving them for the betterment of society; by advancing knowledge and bringing it to the youth, the general public and management; by playing an important part in the balancing competing interests; and by providing the various academic disciplines with the same opportunities, thus enhancing the multi-disciplinary approach to problem solving.

Dr. Hamé Watt
Director
ACKNOWLEDGEMENTS

The 20th Anniversary Commemoration would not have been possible without the help and support of many. The Center acknowledges the support of many members of the UDC staff including: Tom Kelly, Ed Jones, Jack Martinelli, Edward Franklin, Marvin Jackson, Leon Gurley, video staff, Cliff Young, Sue Reddick, Edith Smith, and Ernest White. The activities of the 20th anniversary celebration culminated with a very informative symposium; we thank the symposium panel members and participants, including: Julius F. Nimmons, Jr. (UDC), Phil Cohen (USGS), James Burton (USGS), Ferial Bishop (DCRA), ED Scott (DPW), Cordell Peterson (COE), Roland Steiner (ICPRB), Jim Shell (COG). We would like to thank the US Geological Survey staff which participated directly in the commemoration; especially John Schefer, Gene Hampton, Toni Johnson, and Patrick Leahy. We are greatful for the support of EPA staff, including; James Elder, Pat Bonner, Victor Mcmahon, Anne Robertson, Charline Shaw and John Woods. The assistance of the Corps of Engineers' staff was outstanding; we thank Mr. Perry Costas, and Douglas Pickering. The National Institutes of Water Resources and the USGS loaned us their exhibits, which were invaluable in explaining their water research programs. Special mention is made to students from Backus Junior High School, Hart Junior High School, Sousa Middle School, and Janney Elementary School who enthusiastically participated in the program.

Finally, the 20th Anniversary Commemoration was made possible through the efficient and dynamic work of the DC WRRC staff: James Hannaham, Jutta Schneider and Joseline Castanos.

The activities on which this report is based were financed in part by the Department of the Interior, U.S. Geological Survey, through the Water Resources Research Center, the University of the District of Columbia.

The contents of this publication do not necessarily reflect the views and policies of the Department of the Interior, nor does mention of trade names or commercial products constitute their endorsement by the United States Government.

The University of the District of Columbia is an equal opportunity and affirmative action institution. Its programs, employment and educational opportunities are available to all qualified persons regardless of race, color, religion, national origin, sex, age, marital status, personal appearance, sexual orientation, family responsibilities, matriculation, physical handicap or political affiliation.
Letters of Recognition
Message from the President

I applaud the District of Columbia Water Research Center (DC WRRC) on its twenty year of service to the University, the District of Columbia, and the nation.

As a component of the only urban land grant university in the U.S., the DC WRRC has consistently worked to protect and preserve one of the most precious resources - water. Through its work, the Center has significantly increased our knowledge of water related issues in the District of Columbia and has provided important research opportunities for University faculty and students. I especially commend the Center's efforts to increase the number of minority students and professionals in environmental field, specially of water resources issues and problems in urban communities.

In the anniversary document, you will find a description of anniversary events as well as summaries of the DC WRRC's activities during twenty years of water research, technology transfer, youth training and public service. This book serves both to illustrate the scope of the research and provide a general overview of the Center's accomplishments.

The past twenty years have provided a strong base for the UDC's Water Center. The Center has positioned the University of the District of Columbia to be on the leading edge of the environmental renaissance that will transform cities across America. The Center has also extended the influence of the university beyond the limits of the city to the nation and to the world. I highly praise the work of Dr. Hame Watt and his staff. I wish them many more years of success and charge them with continuing their outstanding work into the 21st century.

Tilden J. LeMelle
President
March 15, 1994

Dr. Hame Watt
Director
DC Water Resources Research Center University of the
District of Columbia 4200 Connecticut Ave. N. W.
Washington, D. C. 20008

Dear Dr. Watt:

The University of the District of Columbia is proud of the Water Center's achievements over the past 20 years. From the beginning, WRRC researchers have been dedicated to identifying and finding solutions to critical water concerns in the District of Columbia. Projects have included water quality, water quantity as well as institutional management.

In keeping with the UDC land-grant mission, the WRRC has excelled not only in research and training, but also in outreach and public service. You have provided the DC Government and the region with outstanding research and advisory guidance for their policy work. The Center has been instrumental in spearheading the involvement of minority institutions in this very important field.

The Center's work does not end with the completion of a scientific experiment, in addition, WRRC researchers then offer solutions to government officials, homeowners and businesses. WRRC has also acted as a hub for information exchange through its numerous conferences and workshops. The Center's publications are requested from every corner of the country and world-wide.

Congratulations to you and your staff!

Sincerely,

Julius F. Nimmons, Jr. Provost and
Vice President for Academic Affairs

JFN:mmj
Reference File: ED/Research
In Reply Refer To: March 7, 1994
Mail Stop 424

Dr. Hame M. Watt
Director, D.C. Water Resource Research Center
University of the District of Columbia
Washington, D.C. 20008

Dear Dr. Watt:

I congratulate the District of Columbia Water Resources Research Center as it marks 20 years of service to the University of the District of Columbia, the District of Columbia, and the Nation. The Center has been successful in organizing and conducting a well-balanced program of research, education, and community outreach responsive to the water resources problems of the District.

The District of Columbia Water Resources Research Center is an active and productive member of the nationwide network of 54 such institutes and centers currently authorized by the Water Resources Research Act of 1984. Your membership on the Board of Directors of the National Institutes for Water Resources, the national organization of the 54 institutes, contributes greatly to the strength of this network and the entire program of the National Institutes for Water Resources.

I wish you continued success as you strive to educate the scientists and leaders who will address the future water resources problems of the Nation.

Sincerely,

John E. Schefter
Chief, Office of External Research
Dr. Hame Watt, Director  
University of the District of Columbia  
Water Resources Research Center  
4200 Connecticut Avenue, NW  
Washington, D.C. 20008  

Dear Dr. Watt:  

On behalf of the Government of the District of Columbia, it is a fortuitous opportunity to extend our congratulations to the Water Resources Research Center, University of the District of Columbia, on their 20th anniversary.  

Over the past 20 years, the Water Resources Research Center has participated in cooperative partnerships with the District Government as well as providing us with excellent technical advice and service.  

The supportive faculty and staff of the Water Resources Center, has assisted in the transformation of the District Government's management of its waterways and water resources into an educational and technical organization.  

The innovative personnel at the Research Center deserve accolades for the service they provide to the District Government as well as to students and the local Washington Metropolitan citizenry.  

Again, congratulations on a very successful 20 years.  

Sincerely,  

Ferial S. Bishop  
Administrator
Dear Dr. Watt:

As a member of the Science Advisory Council of the D.C. Water Resources Research Center, I want to take this opportunity to express my greatest satisfaction with the Center's mission of advancing water resources issues. I am especially pleased with the excellent research activities in the area of water quality. The current research areas, including those areas for which you had submitted Requests for Proposals that I reviewed, will provide innovative solutions to water resources issues facing the District of Columbia. I am very proud to be a member of your team and I look forward to continuing providing input into the Center's program.

Should you have any question or wish to discuss any issue before our next meeting, please feel free to call me at (215) 597-6448.

Sincerely,

David M. Kargbo, PhD
Senior Soil Scientist
Dear Dr. Watt:

I congratulate the D.C. Water Resources Center as it celebrates its 20th anniversary. My office has been associated with the Center through representation on its Research Advisory Council for a number of years.

The National Capital Region of the National Park Service has worked with the D.C. Water Resources Research Center on several projects and is currently increasing cooperation through a Memorandum of Understanding. For 20 years the Center has conducted research studies and public outreach efforts that have been beneficial to the District of Columbia and the region's water resources managers.

I congratulate you and your staff for the remarkable efforts during these past years and look forward to continuing effective cooperation between the National Capital Region and the D.C. Water Resources Research Center.

Sincerely,

[Signature]

Regional Director, National Capital Region
Dear Dr. Watt:

It was good to see you last month and to have the opportunity to chat for a while prior to the television interview with Colonel Capka at the University.

I am pleased to write to you today to congratulate you and the Center on the occasion of your 20th year of performing the invaluable service of keeping water issues in the forefront and encouraging others to develop their interests in water resources and water quality. Keep up the good work!

Sincerely,

Perry Costas
Chief, Washington Aqueduct Division
April 5, 1994

M. Hame Watt, Ph.D., Director
Water Resources Research Center
University of the District of Columbia
Building 50, 4200 Connecticut Avenue, NW
Washington, DC 20008

Dear Dr. Watt:

On behalf of the Commission, I offer my congratulations to the District of Columbia Water Resources Research Center on reaching its 20th Anniversary. The Center has made significant contributions to water resources research and education, its mandate under the Water Resources Research Act. But just as important, the Center has played a significant role in creating an environmental awareness in the Washington, DC community for its surrounding water resources. That effort is reflected in the renewed interest and participation by the District in the Anacostia, Potomac and Chesapeake Bay restoration efforts as well as the active role you and Jim Hannaham play on the Commission.

Again my congratulations and best wishes for many more years of productive contributions in the water resources field.

Sincerely,

Herbert M. Sachs
Executive Director

HMS/pr
Dr. Hame Watt  
Director  
DC Water Resources Research Center  
University of the District of Columbia  
4200 Connecticut Ave., N.W., MB 5004 Washington, D.C. 20008  

Dear Dr. Watt:  

I take this opportunity to offer my sincere congratulations to the Water Resources Research Center for 20 years of exceptional public service, research and teaching on behalf of the District of Columbia.  

Since its beginning, the Center has played a vital role in providing educational opportunities and conducting research in cooperation with faculty, students and citizens in the District of Columbia and beyond. The Center has been instrumental in identifying critical water resources issues in the metropolitan area, increasing public awareness of the importance of water quality and creating a forum for the exchange of scientific information.  

As the only Water Resources Research Center at an urban Black land-grant University, you should be congratulated for championing issues critical to the nation's cities. In spite of limited fiscal and human resources, you and your excellent staff have done a remarkable job.  

Now that the foundation is well established, I would hope that the District Government will complement your achievements with greater support and recognition of the critical importance of the Center as an integral part of the University's land-grant mission.  

Again, my sincere congratulations!  

Sincerely,  

N. Joyce Payne  
Director, OAPBC  

cc: TLeMelle
March 3, 1994

Dr. Hamé Watt Director  
DC Water Resources Research Center 
University of the District of Columbia  
4200 Connecticut Ave., N.W. MB 5004  
Washington, D.C. 20008

Dear Dr. Watt:

I have been associated with the DC Water Resources Research Center as a principal investigator and as a Research Advisory Council member for a number of years. As the Water Resources Center celebrates its 20th anniversary, I look with pride at its contributions and accomplishments. The Center has provided significant solutions to the District of Columbia water resources problems. The Center has given research opportunities to the faculty and training to many students, most of whom now work for the District Government. The fruits of the Center's work have reached local as well as international levels.

This important part of the University of the District of Columbia's land-grant mission has stimulated important research, has emphasized information transfer, and provided public service.

The University of the District of Columbia continues to benefit from your capable guidance and staff in this very important field.

Sincerely,

Dr. Jose Jones  
Chairman, Dept of Environmental Sciences  
University of the District of Columbia
Dear Hame:

I'm pleased to learn of your Commemorative Symposium and regret that I cannot attend. Your initiatives in the water resources community have been indeed laudable and we in the Towson Office join you in your celebration!

Sincerely,

James S. Peters
District Chief,
MD-DE-DC District
INTRODUCTION

The DC Water Resources Research Center was created in 1973 by authority of the Water Resources Research Act of 1964 (P.L. 88-379) which established a federal/state partnership in research, information transfer and education regarding water-related issues. The program has been re-authorized several times and is currently operating under the Water Resources Research Act (P.L. 101-397) as amended. To administer the program, a series of institutes were authorized at land grant institutions in each state, the District of Columbia, Puerto Rico, Guam and the Virgin Islands.

In accordance with the provisions of the Water Resources Research Act, the DC WRRC was given the following missions:

* Plan and conduct competent research, either basic or practical, with respect to water resources
* Promote the dissemination and application of the results of the research efforts
* Provide for the training of scientists and engineers

* Cooperate closely with all colleges and universities in the District that have demonstrable research capabilities
* Cooperate with other institutes to effectively confront regional water and land related problems

To ensure the appropriateness of the DC WRRC's program, the Center is served by two advisory groups: the Research Advisory Council and the Technical Evaluation Committee. The members of the advisory groups are drawn from universities and public or private organizations that manage and use water in the DC area (see Appendix A).

In its work, the DC WRRC uses its connection and similar interests to cooperate with various agencies throughout the region and the country. Among others, the Center is part of the networks of 1) the National Institutes for Water Resources, 2) the Historically Black Colleges and Universities, and 3) the United States Geological Survey and the State Geological Surveys. Additionally, close relationships with District of Columbia government agencies and universities have helped to enrich the Center's program and to keep abreast of the water resources issues of interest.

In the past, the DC WRRC has conducted, sponsored and/or managed over 100 projects addressing various water resources issues in the District of Columbia. The Center has also held more than 80 seminars and conferences, and has trained more than 150 students in a variety of academic fields.
20th Anniversary Events
The D.C. Water Resources Research Center (DC WRRC) of the University of the District of Columbia was established in 1973 based on the Water Resources Research Act of 1964 (PL 88-379). The Act established a federal/state partnership in water resources-related research, information transfer, and education. Since then, the WRRC staff and associated investigators have contributed greatly to water resources research, management and education in the District of Columbia. The WRRC's list of publications lists more than 100 technical reports and proceedings from these efforts. Research projects have addressed river ecology, groundwater and surface water quality and quantity, erosion and sedimentation, nonpoint source pollution, water resources management, public perception of water issues, and many other topics. Through its projects, the WRRC has trained more than 150 undergraduate and graduate students, most of which have obtained degrees in a water resources-related field. The WRRC has organized numerous conferences, symposia, and seminars, as well as field trips and exhibits. A quarterly newsletter is also published to provide information of current water resources issues in the Washington, DC area. By participating in a variety of local and regional advisory commissions, the WRRC maintains contact with other agencies concerned with water resources issues.

To celebrate 20 years of successful water resources research, the WRRC sponsored a number of events as part of National Geographic's National Geography Awareness Week, which this year focused on "WATER". The events were:

Exhibits
Movie Break
Radio Talk Show Water Data Systems
Demonstration Panel Discussion
Reception held in honor of past and present Principal Investigators.
University of the District of Columbia Celebrates 20 Years of Water Resources Research

(WASHINGTON, D.C.) November 10, 1993 -- The D.C. Water Resources Research Center the University of the District of Columbia will commemorate 20 years of successful water resources research in the District of Columbia by sponsoring a month-long program in November of wa, quality exhibits, demonstrations, feature-films, documentaries, UDC cable TV and radio talk show and a symposium.

The program will highlight water resources issues in the District of Columbia, such as drinking water, erosion and runoff, and ecology. The program is being presented in conjunction with t1 National Geographic Society's focus on "Water Matters" as part of its National Geography Awareness Week (Nov. 14-20).

The D.C. Water Resources Research Center (WRRC), established in 1973, has made significant contributions to water resources research, management, and education in the District of Columbia major urban area in the Chesapeake Bay watershed. Research projects by the WRRC include rive ecology, ground water and surface water quality and quantity, erosion and sedimentation, nonpoint source pollution, water resources management, public perception of water issues, and other topics. In addition, the WRRC successfully supported the entry of minority and other university professionals into water-resources fields. Some 130 students have been have obtained degrees and employment in water resources disciplines.

The WRRC participates in a variety of local and regional advisory committees and contributes to the Chesapeake Bay Program network of information. The Chesapeake Bay Program is the mul governmental partnership that has been directing and conducting the Chesapeake Bay restorab since 1983. It includes the District of Columbia; the states of Pennsylvania, Maryland and Virginia the Chesapeake Bay Commission; and the U.S. Environmental Protection Agency representing the federal government.

For more information about the D.C. Water Resources Research Center 20-year celebration contact: Tom Kelly, UDC Public Affairs Office, at (202) 282-7700.

A schedule of activities is included on the following page.
**DC WRRC 20th Anniversary Events**

November 1-25, 1993

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
<th>Time</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exhibits</td>
<td>Nov.</td>
<td></td>
<td>Van Ness Campus</td>
</tr>
<tr>
<td></td>
<td>Dec.</td>
<td></td>
<td>Building 41</td>
</tr>
<tr>
<td>Movie Break</td>
<td>Nov. 3,10,</td>
<td>12:30P</td>
<td>Van Ness Campus, Bldg 41, A-03</td>
</tr>
<tr>
<td></td>
<td>Nov. 18,24</td>
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<tr>
<td>Radio/ TV Talk Show</td>
<td>Nov 16</td>
<td>Noon</td>
<td>90 FM</td>
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<tr>
<td>Demonstrations</td>
<td>Nov 18</td>
<td>6:00pm</td>
<td>Channel 19</td>
</tr>
<tr>
<td>Water Data</td>
<td>Nov 18</td>
<td>10:00</td>
<td>Van Ness Campus Library</td>
</tr>
<tr>
<td>Systems</td>
<td>Nov</td>
<td>Noon</td>
<td>Building 41</td>
</tr>
<tr>
<td>Publications &amp;</td>
<td>Nov</td>
<td>8-22</td>
<td>Van Ness Library, Bldg. 41</td>
</tr>
<tr>
<td>Brochures, etc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20th Anniversary</td>
<td>Nov 17</td>
<td>1:00</td>
<td>Van Ness Campus, Bldg 41, A -03</td>
</tr>
<tr>
<td>Commemorative</td>
<td></td>
<td>4:00p</td>
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<tr>
<td>Symposium and</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reception</td>
<td>Nov 17</td>
<td>4:00-5:00p</td>
<td>Van Ness Campus, Bldg. 41, Room A-03</td>
</tr>
<tr>
<td>Publications &amp;</td>
<td>Nov</td>
<td>8-22</td>
<td>Van Ness Library, Bldg. 41</td>
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<tr>
<td>Brochures, etc.</td>
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UNIVERSITY OF THE DISTRICT OF COLUMBIA
DC WATER RESOURCES RESEARCH CENTER 20TH ANNIVERSARY

Contribution To

The National Geography Awareness Week
Theme: “Water Matters”

in cooperation with

National Geographic Society; “The Geography of Freshwater”
National Public Radio; "Radio Expeditions;" "Water Thirsting for Tomorrow
Department of the Interior, US Geological Survey
National Institutes for Water Resources (NIWR)

"A CELEBRATION OF 20 YEARS OF WATER RESOURCES
RESEARCH IN THE DISTRICT OF COLUMBIA"

<table>
<thead>
<tr>
<th>Event</th>
<th>Description</th>
<th>Date/Time</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exhibits</td>
<td>Special exhibits on water resources on loan to the University on display UDC Van Ness Campus library.</td>
<td>Nov-Dec</td>
<td>Van Ness Library Bldg. 41</td>
</tr>
<tr>
<td>Documents &amp; Flyers</td>
<td>Several documents from the EPA, NIWR, USGS, Fish and Wildlife, National Geographic Society, etc. for distribution.</td>
<td>Nov-Dec</td>
<td>Van Ness Library Bldg. 41</td>
</tr>
</tbody>
</table>
"A CELEBRATION OF 20 YEARS OF WATER RESOURCES RESEARCH IN THE DISTRICT OF COLUMBIA"

 подробное описание

**UNIVERSITY OF THE DISTRICT OF COLUMBIA**
**DC WATER RESOURCES RESEARCH CENTER 20TH ANNIVERSARY**

*Contribution To*

**The National Geography Awareness Week**
**Theme: "Water Matters"**

*in cooperation with*
**UDC Learning Resources**

---

**Movie Break**

Time: 12:30 PM

Location: Van Ness Campus, Bldg. 41, Room A-03
4200 Connecticut Ave. N.W., Washington, D.C. 20008

<table>
<thead>
<tr>
<th>Date</th>
<th>Feature Movies</th>
<th>Documentaries</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/3</td>
<td>Jean de Florette</td>
<td>Water - The Life Giving Resources</td>
</tr>
<tr>
<td>11/10</td>
<td>Manon of the Spring</td>
<td>Saving Water- The Conservation Video</td>
</tr>
<tr>
<td>11/18</td>
<td>A River Runs Through it</td>
<td>Careers in Water</td>
</tr>
<tr>
<td>11/24</td>
<td>The Milagro Beanfield War</td>
<td>Journey to the Forgotten River</td>
</tr>
</tbody>
</table>
The story of Jean Cadoret, hunchback who inherits a farm from his mother and foolishly hopes to become a gentleman farmer. But even before he arrives, his powerful neighbor is plotting to steal his land. The ending is a heartbreak and tragedy for Jean who is no match for his wily neighbor.

Water: The Life Giving Resource
12 min. Texas A & M University, color

A documentary celebrating 25 years of water research. The film emphasizes the importance of water to every day life and stresses the need for creating a balance between having enough water for the environment, agriculture, industry and recreation.

Manon of the Spring 113 min. 1988, Dir. Claude Berri, color

Ten years have passed since the tragic events of Jean de la Florette. Jean's daughter, Manon, appears in town to accuse the Soubeyrans of killing her father. A tragedy results that nearly destroys Cesar, the neighbor who destroyed Jean.

The Milagro Beanfield War 118 min. 1988, Dir. Robert Redford, color

A comedy that begins when a Chicano handyman from the Milagro Valley, New Mexico, decides to irrigate his beanfield with water "borrowed" from a large and potentially destructive development site. The result is a culture clash between the developers and the planters.

A triumphant, critically acclaimed masterpiece, "A River Runs Through It" is a heartfelt study of a bygone era, and of a loving family that never really understands each other. Set in Montana between 1910 and 1935, the story revolves around two fly fishing brothers, one headed for success and the other for tragedy, their stern father and the river that, in many ways, reflects their lives.

Water Pollution Control Federation
Journey to the Forgotten River 59 min. 1990, National Geographic

Witness the inter-play of predator and prey in the Linyanti Region of Botswana, where drought plagued wild life find life saving water. Winner of Best popular science award of Baniff Film & TV Festival.
## Radio Talk Show

<table>
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<tr>
<th>Event</th>
<th>Description</th>
<th>Date/ Time</th>
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<tbody>
<tr>
<td>Radio/ 17V Talk Show</td>
<td>Isyperts MR1 discuss drinking water issues impacting the District of Columbia with call-in questions from the public.</td>
<td>Nov. 16 6:00 P</td>
<td>UDC Cable TV Channel 19</td>
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<td></td>
<td>- James Elder, Director, Office of Drinking and Ground Water, EPA</td>
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<td>- Mr. Douglas Pickering, Deputy Chief Washington Aqueduct Division, US Corps of Engineers</td>
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<td>- Dr. Ham6 Watt, Director Water Resources Research, UDC</td>
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"A CELEBRATION OF 20 YEARS OF WATER RESOURCES RESEARCH IN THE DISTRICT OF COLUMBIA"

Demonstrations

Water Data Systems

Dr. James Burton of the U.S. Geological Survey will demonstrate computer-driven water data systems to a number of students. November 17-18, 1993

Water Quality Van

USGS van equipped with water quality instrumentation will be on display at the University Plaza. Nov 17-18, 1993
PORTABLE CLEARINGHOUSE DEMONSTRATION
BY

Dr. James S. Burton
Chief, National Water Data Exchange

The portable clearinghouse consists of an AST 4/25 SL PowerEXec laptop computer, a CD-ROM drive, and a portable Diconix printer. The computer has the following software running under a Windows 3.1 environment:

- a prototype version of the Master Water Data Index developed by the Montana State Library, Helena, Montana
- the Water Data Sources Directory
- software for accessing the Environmental Protection Agency's STOrage and RETrieval System (STORET)
- PC-WATSTORE, user-friendly software for accessing data in the U.S. Geological Survey's WATer Data STOrage and RETrieval System (WATSTORE)
- software for accessing the Water Resources Abstracts- Volume 1, 1967-June 1993 on CD-ROM
- software for accessing the data in the Hydro-Climatic Data Network: (HCDN), Streamflow Data Set, 1874-1988, on CDROM
- software for accessing the State Water-Data Reports, Hydrologic Records of the United States, Water Years 1990 and 1991

Thursday, November 18, 1993
10:00 a.m. - 12:00 noon
Van Ness Campus Library
"A CELEBRATION OF 20 YEARS OF WATER RESOURCES RESEARCH IN THE DISTRICT OF COLUMBIA"

Publications & Brochures of the WRRC.

<table>
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<tr>
<th>Event</th>
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<tr>
<td>Publications &amp; Brochures, etc.</td>
<td>Information materials listed below will be made available at UDC Library.</td>
<td>Nov 8-22</td>
<td>Van Ness Library Bldg. 41</td>
</tr>
</tbody>
</table>

Commemorative Events Flyers

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<th>Commemorative Events Flyers</th>
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<tr>
<td>20th Anniversary Events Brochure</td>
<td>Lead</td>
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<tr>
<td>Flyer for movie break</td>
<td>Outreach</td>
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<tr>
<td>Poster Announcement</td>
<td>Water management</td>
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<tr>
<td>Flyer announcement</td>
<td>Land Use</td>
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<tr>
<td>Cable TV flyer</td>
<td>Anacostia Researcgh</td>
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<tr>
<td>Radio discussion flyer</td>
<td>List of WRRC Publications</td>
</tr>
<tr>
<td>Demonstration flyer</td>
<td>WRRC Training Brochure</td>
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<tr>
<td>Symmposium flyer and program</td>
<td>WRRC Seminars &amp; Conference</td>
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</tbody>
</table>
SYMPOSIUM

"WATER RESOURCES

Location: Bldg. 41, Room A-03
Date: November 17, 1993
Time: 1 p.m. - 5:00 p.m.

1.00 - 1:30
Introduction by Dr. Ham6 Watt, Director, WRRC
Welcome remarks by Dr. Julius F. Nimmons, Provost and VP of Academic Affairs, University of the District of Columbia
Keynote by Phil Cohen, Chief, Water Resources Div., USGS

1:30 - 3:30
Panel Discussion
Moderator: Dr. James Burton, Director
National Water Data Exchange (NAWDEX)
Participants:
Mrs. Ferial Bishop, Administrator
Environmental Regulation Administration, DCRA
Mr. Ed Scott, Director
DC Water Sewer Administration
Mr. Cordell Peterson, Chief of Engineering and Planning
Washington Aqueduct Division, US Corps of Engineers
Dr. Rolando Steiner, Staff Scientist
Interstate Commission on the Potomac River Basin
Mr. Jim Shell, Chief
Urban Watershed Planning, Washington Council of Governments

3:30 - 4:00
Recognition of Principal Investigators
Dr. Julius F. Nimmons, Provost and V.P. for Academic Affairs
University of the District of Columbia

4:00 - 5:00
Reception and refreshments (Building 41, Reception Area)
UNIVERSITY OF THE DISTRICT OF COLUMBIA  
DC WATER RESOURCES RESEARCH CENTER 20TH ANNIVERSARY  

Contribution To  
The National Geography Awareness Week  
Theme: "Water Matters"  
in cooperation with  

National Geographic Society; "The Geography of Freshwater"  
National Public Radio; "Radio Expeditions;" "Water Thirsting for Tomorrow"  
Department of the Interior, US Geological Survey  
National Institutes for Water Resources (NIWR)  

"A CELEBRATION OF 20 YEARS OF WATER RESOURCES RESEARCH IN THE DISTRICT OF COLUMBIA"

Reception  
Hosted by Dr. Julius F. Nimmons, Jr. Vice President of Academic Affairs and Provost, University of the District of Columbia  

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<tr>
<td>Reception</td>
<td>Following the symposium on &quot;Water Resources Management in the Nation's Capital; Towards the Year 2,000&quot; a special reception to recognize and honor the contributions made by WRRC Principal Investigators.</td>
<td>Nov 17 4:00 - 5:00pm</td>
<td>van Ness Campus Bldg. 41 Room A 03</td>
</tr>
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INTRODUCTION

DR. HAME M. WATT
DIRECTOR, DC WRRC UNIVERSITY OF THE DISTRICT OF COLUMBIA

We all know water is essential to human survival. Today water resources problems have reached a very critical stage worldwide. The National Geographic Society, the US Geological Survey, the National Public Radio and many other agencies have launched during this month of November an immense outreach effort to promote a deeper understanding of water resources and to bring us meaningful new ways to preserve the world's most precious natural resource. As part of the National Fresh Water Week, the DC WRRC is carrying out the following activities: movie break, radio talk show, TV showings, exhibitions, distribution of documents and the commemorative symposium.

The Center has benefited from the support of the University's leadership in carrying out its mission and performing these activities. I hereby introduce a strong leader and supporter of the Center, Dr. Julius F. Nimmons, Jr. Dr. Nimmons is the Provost and VP of Academic Affairs and will give you welcome remarks.

WELCOME REMARKS

DR. JULIUS F. NEIMMONS, JR.
PROVOST AND VICE PRESIDENT FOR ACADEMIC AFFAIRS
UNIVERSITY OF THE DISTRICT OF COLUMBIA

The Water Center joins me to thank all those who have contributed to the success of this event, including the UDC Learning Resources, Provost's Office, Special Events, UDC Radio Jazz 90, Administrative Services, Reproduction Department, and other departments that enthusiastically and kindly have lent their support. We also thank the agencies who have taken the time to be part of this event, and share their knowledge and vision with us.

The University is proud of its Water Resources Research Center and its achievements over the last 20 years. During the past twenty years, the DC WRRC staff and associated investigators have made significant contributions to water resources research, management and education in the District of Columbia. Through its projects, the DC WRRC has trained more than 130 undergraduate and graduate students, most of whom have obtained degrees and employment in a water resources-related field in the District and Federal Governments and in international agencies. The UDC's Water Center draws its expertise from all relevant colleges and departments at UDC, including the Environmental Sciences, Biology, Civil Engineering, and Business and Public Administration Departments, and from other universities in Washington, D.C.
To enhance its program, UDC has entered into agreements with agencies such as the US Geological Survey, and the National Park Services.

At this point I want to talk to you about our University. We at UDC are kind of new kids on the block, when compared with the other universities, even though our roots go back over 100 years to the teacher's school established in 1851 by Myrtlella Miner.

A brief historical explanation is as follows; the University of DC is the consolidation of three institutions: DC Teacher's College, Washington Technical Institute and Federal City College which were merged in 1978 to become the UDC. As you may know the University is predominantly a minority institution with enrollment of about 12,000 students.

The University has newly created a research, training, and international division in which the land grant units, and other research departments are located. I would like to offer you the opportunity to look us over very carefully because we do have quality programs within these walls, such as the Water Resources Research Center and many other programs

Welcome to UDC, and enjoy the symposium which will be followed by a reception. We also encourage you to visit the Water Center exhibits in the library next door.

Because of our privileged location in the nation's capital, we can easily call on the leadership and expertise of federal, local and regional governments to participate and enhance our programs. One of these lead agencies, responsible for the nation's water resources, is represented here today. That agency is the US Geological Survey. It is my immense pleasure and privilege to introduce to you the Chief Hydrologist of the Water Resources Division of the US Geological Survey, Mr. Philip Cohen.
The D.C. Water Resources Research Center is one of 54 such centers or institutes first authorized by the Water Resources Research Act of 1964 and located at land grant universities across the nation. These centers each receive a small matching grant from the federal government to help support a program of water resources research, education, and information and technology transfer. The Water Resources Division of the U.S. Geological Survey has administered these grants, through its State Water Resources Research Institute program since 1984.

The 54 centers or institutes are as different and unique as the States and territories that they serve, but they all share the same objectives. The Water Resources Research Act requires that they develop programs that "foster the entry of new research scientists into water resources fields: the training and education of future water scientists, engineers, and technicians; the preliminary exploration of new ideas that address water problems or expand understanding of water and water-related phenomena; and the dissemination of research results to water managers and the public. The institutes are required to develop their programs of research, education, and information and technology transfer in close collaboration with leading water resources officials in their States and with interested members of the public.

The institute program encourages a "bottom-up" approach to water resources problem identification and solution and promotes interactions between the Federal, state and local governments and the university community. The institutes have established themselves as a primary link between the academic community and water-related personnel throughout government and the private sector. In recent years, the institutes have each year collectively supported nearly 800 research projects on over 100 university campuses. These projects cover a wide variety of topics in the traditional water resource fields of engineering and hydrology, as well as the biological and social sciences (including law). Though the emphasis varies across the nation, depending upon state and regional priorities, the most common topics are surface-and ground-water quality and toxic substances.

Over 1200 undergraduate and graduate students receive training by participation in these projects. The institutes annually support the completion of-about 140 Master's theses and Ph.D. dissertations using their federal grants and required matching funds. Additional theses and dissertations are supported using other sources of funds.

Under their information and technology transfer programs, the institutes sponsor seminars, conferences and workshops, publish newsletters, reports, books, and articles in scientific refereed journals, and produce videos on water-related topics. In recent years, the institutes have produced nearly 1000 publications per year, 25 percent of them in scientific refereed journals. In 1992, the institutes sponsored or cosponsored a total of 134 conferences on
water-related issues, and 42 of the institutes published a total of nearly 200 newsletters reaching approximately 150,000 readers.

Though each of the institutes tends to focus on local and regional problems, these problems are not all unique, and the results of much of the research are frequently applicable elsewhere. For example, a project sponsored by the Virgin Islands Institute resulted in a law regulating bottled-water quality. This law is currently being considered as a model for similar legislation by another state. The strength of the Water Resources Research Institutes lies in their network which facilitates the transfer of research results and, in this way, leverages the federal investment in the State Water Resources Research Institute program.

The D.C. Water Resources Research Center has been an active and productive part of the institute network. In recent years, it has supported research on such topics as the effects of pollution on the ecology of the Anacostia River, the impact of erosion and sedimentation on the water quality of the estuarine portion of the Anacostia, activators and inhibitors of hydrilla enzymes, the determination of dissolved metals introduced into municipal water as a result of deterioration of water distribution lines, and the toxicity of Anacostia River sediments. These, and other research projects, have helped support and contribute to the education of about 15 students each year.

Under its information transfer program, the D.C. Center produces a series of technical reports and contributes to the scientific literature. It supports a seminar series which brings academic and state federal government water resource experts on campus to share their expertise and insights with UDC students. In recent years, it has sponsored or co-sponsored conferences on such topics as the Anacostia River, agricultural chemicals and ground-water quality, submerged aquatic vegetation in the Potomac, acid rain, underground storage tank management and compliance, assessment of the ground-water resources of the District, and computerized water data management and information systems.

In carrying out its program, the DC Center has, appropriately, drawn at one time or another upon not only the expertise on its own campus, but also on that of American, Catholic, Georgetown, George Washington, and Howard Universities. Dr. Watt also serves on the Executive Council of the National Institutes for Water Resources, the national organization of the 54 institutes. These kinds of regional and national linkages contribute greatly to the strength of individual institutes and the entire institute program.

The D.C. Center has reached beyond the university community with its programs. It supports local agencies in their efforts to increase awareness about such issues as lead in drinking water, radon, and the effect of urban activities on water quality. It also presents awards for outstanding water resources research projects at local high school science fairs.

Due to the efforts of the D.C. Center, the President of UDC, the Director of the USGS and the Regional Director of the National Park Service have entered into a memorandum of understanding in support of education in water resources in the District of Columbia. As one
part of this agreement, the USGS and the Park Service are in the process of installing a state-of-the-art gauging station in Rock Creek Park. USGS, Rock Creek Park, and UDC personnel will cooperate in developing an educational display concerning this stream flow and water quality monitoring station and will conduct educational tours of the station for elementary, high school, and college students. Construction on the gauging station is scheduled to begin as early as this week.

Other parts of the agreement concern the sharing of USGS scientific exhibits and equipment with UDC, and providing information on opportunities for college and high school students to work with USGS personnel on data collection and analysis activities on a pay or volunteer basis.

The institute program has proven to be an effective federal-state partnership for promoting water resources research and education nationwide. It is, however, not our only partnership with faculty and students on many campuses across the country. We are especially proud of our partnership with many minority institutions. Let me give you a few examples.

The Water Resources Division of the USGS has a cooperative research program with Kentucky State University. This program is designed to describe and assess the hydrologic processes and impacts of sustainable agricultural management practices. The University's role in the project is to evaluate and predict the movement of agricultural chemicals in the vadose zone. A test plot has been instrumented at the KSU Research Farm and includes a climatological station, runoff collection, and special instrumentation. The study examines the effects of two non-traditional sustainable cash crops (bell peppers and pumpkins) and of three soil management practices. The project is providing an opportunity for KSU students to become involved in science and to be trained to operate instruments and collect samples for analysis. It is also contributing to development of alternate cropping systems for farmers with limited resources.

KSU is also cooperating in a research project to determine if changes in the concentration of heavy metals recorded in the annual shell layers of mussels may be used to assess intermediate to long term trends in water quality.

This year we hope to cooperate with Kentucky State University in a study to evaluate the effects of urban nonpoint-source contaminants in a karst terrain.

The Ohio District of the Water Resources Division has been cooperating with Central State University in a number of areas. It provides lectures of the water resources seminar class at CSU International Center for Water Resources Management, provides training in the use of computer hardware and software granted to CSU by the USGS, and provides advice on job placement in water resources careers, especially ones with the USGS.

The Water Resources Division has been working with Fort Valley State College's Cooperative Developmental Energy Program. This year, our primary focus will be to recruit
students for summer internships and cooperative program assignments with the USGS. This provides the USGS with the opportunity to recruit talented minority and female students majoring in genosciences.

Our Oklahoma district has been working for a number of years with Langston University to develop its program in computer science. It has assisted Langston in obtaining and maintaining computer equipment and networks. It supports a leased data line between Langston and the district office in Oklahoma City, and has installed two routes, one in the district office and one at Langston, to provide students with experience on Internet and Unix networks. The USGS also plans and hosts a guest lecture series for students majoring in computer science and management information systems. Each year students are employed by the district office, where they receive training and experience in the operation of computers and management information systems.

Among other institutions with which the Water Resources Division has cooperated are the Haskell Institute, Tuskegee University, Jackson State University, Elizabeth City State University, and Florida A&M University.

In 1991, the USGS marked the 20th anniversary of the establishment of it Minority Participation in the Earth Sciences Program. The primary function of this program has been the introduction of minorities, women, and the disadvantaged to career opportunities in the earth sciences. It was the under-representation of these groups in the earth sciences that provided the basic stimulus for the creation of the program. It is their continued under-representation, despite the good efforts of the directors of the USGS and literally hundreds of USGS employees who have served as student mentors, that sustains the program. The principal focus of the program is the recruitment of students with an interest in earth science careers so as to provide them with an opportunity to work in earth science with mentorscientists who may further stimulate their interests.

Over the past 20 years, more than 1500 individuals have participated in the program as students at high school, undergraduate, and graduate levels. Of the 1500, more than 30 percent have pursued degrees in earth science, have actually become earth scientists, or are in the process of obtaining degrees in the field, such as chemistry, physics, mathematics, and computer science. Four percent have gone into biological or medical science.

Outside of the academic community, but working with selected universities and federal agencies, the Water Resources Division is assisting the Bureau of Indian Affairs with its Water Resources Technician Training Program. This program is designed to introduce talented Indian youth to the field of water resource development and management. It is intended to provide students with an awareness of potential employment opportunities in the field of water resources and to encourage college education. The Indian people are facing complex natural resource management issues, and it is critical that they have the skills necessary to develop and manage their Tribal water resources.
As I noted earlier, the water resources research institutes are as unique as the areas that they serve. The D.C. institute is the only one in the 48 contiguous states located on the campus of a minority institution. Perhaps more importantly, it is also the only one serving an exclusively urban area. It is therefore especially appropriate that this symposium will address the urban water resources issues facing the District of Columbia as it moves toward the year 2000.

Undoubtedly, the restoration of the Anacostia River will continue to be a primary water resource issue in the District of Columbia. As the D.C. Center noted in a recent report to the USGS, the water quality of the Anacostia and its tributaries remains poor. Non-point source pollution, and other sources associated with urbanization, such as oil spills and construction activities, are among the problems facing the District. The Center also noted that, though groundwater is not a source of water supply in the District, its protection is emerging as an important water resources issue. Groundwater contamination from construction sites, underground storage tanks, landfills, rail yards and other sources are growing concern. I am looking forward to a lively discussion of these and other issues this afternoon. Again, thank you for inviting me here today.
KEYNOTE SPEAKER

PHILIP COHEN
Chief Hydrologist Water Resources Division U.S. Geological Survey

Mr. Cohen has served as Chief Hydrologist of the U.S. Geological Survey (USGS) since 1979. He joined the USGS in 1956 and has held increasingly responsible positions in the Water Resources Division as Geologist/Hydrologist in Carson City, Nevada, and Hydrologist-in-Charge in Long Island, New York. In 1972, Mr. Cohen was appointed Staff Scientist, Office of the Director, Reston, Virginia; and in 1977, he moved on to be the Associate Chief, Research and Technical Coordination, Land Information Analysis. For a short period in 1979, prior to being appointed Chief Hydrologist of the Water Resources Division, he served as Assistant Chief Hydrologist for Scientific Publications and Data Management. Mr. Cohen graduated cum laude from City College of New York with a B.S. degree in Geology in 1954 and he earned an M.S. degree in Geology from the University of Rochester in 1956. Mr. Cohen has been honored with the Department of the Interior Distinguished Service Award, 1979; the Presidential Rank of Meritorious Executive, 1986; and the Presidential Rank of Distinguished Executive, 1988. In 1993, Mr. Cohen received the C. V. Theis Award from the American Institute of Hydrology.

MODERATOR

James Burton
Chief, National Water Data Exchange USGS.

Dr. James Burton is Chief, National Water Data Exchange, U.S. Geological Survey. Dr. Burton holds an A.B. in Chemistry from Berea College, Berea, Kentucky, and M.S. and a Ph.D. in Physical Chemistry from Howard University, Washington, D.C. He began his career in 1963 as a Senior Chemist at Melpar, Inc., Falls Church, VA. He assumed the position of Senior Chemist with the General Technologies Corporation in Reston, VA and went on to become Director, Environmental Science Research. In 1969, Dr. Burton served on the Technical Staff at the MITRE Corporation, McLean, VA. He was Director of the Solar Energy Program in 1973. In 1974, Dr. Burton was Director of the DC Water Resources Research Center, University of the District of Columbia. He joined the US Department of the Interior in 1975 as Assistant Director-Research, Office of Water Research and Technology. Dr. Burton served as Acting Director for the Office in 1977.
Dr. Burton was on the staff of the Assistant Secretary for Land and Water Resources and served as Special Assistant-Water Research Programs in the Bureau of Reclamation, the Office of Water Policy, and the US Geological Survey. Dr. Burton is a member of the American Chemical Society, the American Water Resources Association, the Sigma Xi, and the American Society for Testing and Materials. He has 40 publications.

GUEST PANELISTS

EDWARD M. SCOTT
Administrator Department of Public Works
Water and Sewer Utility Administration

Mr. Scott graduated from Morgan State University, Baltimore, Maryland, in 1954, receiving a B.A. in Sociology and an R.O.T.C. commission in the U.S. Army as a Lieutenant. He also is a graduate of the Armed Forces Staff College. During the next 20 years, he served in a variety of military assignments, including duty with the Arms Control and Disarmament Agency, Department of State, two combat tours in the Republic of Vietnam, and an assignment with the Office of the U.S. Army Chief of Staff in the Pentagon.

In 1977, Mr. Scott became involved in water related activities when he assumed the position of the Chief of the Revenue Division of the Dept. of Environmental Services which was responsible for the water and sewer billing of 127,000 customers. With the establishment of the Department of Public Works in 1984, Mr. Scott was promoted to Chief, and then to the position of Administrator. His professional affiliations include membership in the American Water Works Association, American Public Works Association, National Forum for Black Public Administrators, and the Water Environment Federation. He is a native of Washington, DC, and currently resides in Temple Hill, a Maryland suburb of Washington.

ROLAND C. STEINER
Associate Director for Water Resources Interstate Commission on the Potomac River Basin

Dr. Steiner has worked at the Interstate Commission on the Potomac River Basin for 10 years on issues involving water supply, water quality, and associated land resources. He is currently Associate Director for Water Resources, and has directed the Section for Cooperative Water Supply Operations on the Potomac, with water resource allocation responsibilities for the Washington, DC metropolitan area. Dr. Steiner holds Bachelor's and Master's degrees in Civil Engineering from the University of Pennsylvania and Stanford University respectively, and a Ph.D. from The Johns Hopkins University. Prior to his present position, Dr. Steiner taught Mathematics at the University of Baltimore and worked in England and Wales for national and regional water and wastewater management agencies.
JAMES W. SHELL, JR.
Acting Chief Urban Watershed Planning and Special Programs
Metropolitan Council of Governments

Mr. Shell is currently the Acting Chief of Urban Watershed Planning and Special Programs in COG's Department of Environmental Programs. His background has been primarily in the area of water resources planning as well as the development, review and evaluation of water-related policy issues and technical projects. His 19 years of professional environmental experience have included work on the federal, state, regional and local levels. Additional experience has included point and nonpoint source water quality management and planning; water and wastewater treatment; regulatory assessment and tracking; committee management; development and implementation of monitoring networks; groundwater assessment; oil spills; petroleum pipeline operations; toxics and nutrient assessment, monitoring and control; water quality modeling; watershed planning; stormwater control; best management practices; solid waste management; wetlands; and atmospheric deposition and monitoring. Mr. Shell holds a B.S. degree in Biology from the Virginia Commonwealth University and a M.S. degree in Biology from Radford University, Virginia.

FERIAL BISHOP
Administrator Environmental Regulation Administration
D.C. Department of Consumer & Regulatory Affairs

Mrs. Bishop is currently Administrator of the Environmental Regulation Administration of the D. C. Department of Consumer & Regulatory Affairs (DCRA). Mrs. Bishop serves as the state official for environmental regulation and enforcement within the District of Columbia. She directs and administers District and Federal laws, regulations and Mayoral initiatives governing the environment and the natural resources of the District of Columbia.

Mrs. Bishop has over 25 years of public service in the environmental protection arena. At the EPA she has served as Chief, Registration Support Branch, Office of Pesticides Programs; served as, as a biologist at the Office of Toxic Substance; and Program Analyst, Office of Research Development. She has served on numerous committees, including committees on cultural diversity and on minority institutions. She is a member off the National Council of Negro Woman, National Black Public Administrators.

Mrs. Bishop has B.S and M.S. from Howard University in Microbiology. She currently is the chairperson of the DC WRRC's Advisory Council.
MR. CORDELL C. PETERSON
Chief
Planning and Engineering Branch
Washington Aqueduct Division US
Army Corps of Engineers

Graduate of North Dakota State University 1962 Bachelor of
Science - Civil Engineering

U.S. Army

1962-1967 Civil and Structural Engineer, Washington Aqueduct
1967-1969 Chief, Dalecarlia Section, Plant Operations Branch
1972-1978 Chief, Water Division, Hazen & Sawyer, Consulting
1978- 1979 Engineers, Port Said, Egypt
Chief, Planning and Engineering Branch, Washington
Aqueduct

1979 - Present

27
20th Anniversary
Commemorative
Photographs
Ribbon on Cutting Ceremony
Dr. Burton (USGS) giving a computer data demonstration to students (above). Dr. Watt (IIDQ discusses water resources with Students (below).
Exhibits

School children observe WRRC exhibits at UDC library.
Movie Break
Symposium

Water Resources Symposium Registration (above). Dr. Watt, introducing Symposium (below).
Dr. Julius F. Nimmons, Jr., UDC Provost, giving welcome remarks (above). Mr. Phil Cohen, Chief, Water Resources Division, USGS, Keynote Speaker (below)
Panel members from left to right: Scott, Bishop, Peterson, Shell, Steiner (above).

Symposium audience (below).
Reception

I'M 10q 10 right: Leslie R Elder (Dean, CLS), Julius F. Ninmon Jr, Albert, Jones
University of the District of Columbia
20 YEARS OF WATER RESOURCES RESEARCH

Water Resources Issues in the District of Columbia

The most pressing water resources issue in the District of Columbia is the restoration of the Anacostia River, followed by the design and implementation of a groundwater protection program. Other major issues are lead in drinking water, public education, and establishment of a Geographic Information System.

The District of Columbia government has identified the following specific issues to be of high priority:

- Identification of point and non-point sources of toxics in DC river sediments
- Establishment of a Water Quality Laboratory
- Development of sediment standards for DC waters
- Development of bio-criteria applicable in DC waters as a basis for future water quality standards
- Evaluation of water quality standards set for the Anacostia
- Identifying sources and quantifying pollutant loadings in the Anacostia Basin
- Development of remediation plans for sub-watersheds in the Anacostia River Basin
- Assessment of potential development of Rock Creek as a trout stream
- Development of innovative technologies for Combined Sewer Overflow (CSO) management
- Determination of residential pesticide use
- Development of a nutrient reduction strategy
- Assessment of groundwater impacts on surface water
- Impact study on induced groundwater/surface water interaction (sump pumps)
- Impact assessment of landfill leachate on Anacostia River water quality
- Determination of potential pollution sources impacting groundwater
- Implementation of a long-term groundwater monitoring program
- Establishment of a Geographic Information System
- Operation of an Urban Stormwater Management Clearinghouse
- Development of a public outreach program
Selected List of Publications

I. Social, Institutional, and Management Issues


II. Groundwater Resources, Flow and Transport


Creek Golf Course. DC WRRC Report No. 146. D.C. Water Resources Research Center, Washington, D.C.


III. Water Quality and Chemistry


IV. Biology and Ecology


V. Engineering, Water Supply and Wastewater


VI. Hydrology and Climatic Processes


VII. Proceedings


VIII. Miscellaneous Information Brochures


DC WRRC Special Projects' Abstracts

D.C. GROUNDWATER RESOURCE ASSESSMENT

Since 1989, the DC WRRC has been leading a consortium of local universities (Howard University, The Catholic University of America, The George Washington University, and the University of the District of Columbia) in a groundwater resource assessment for the District of Columbia, sponsored by the D.C. Department of Consumer and Regulatory Affairs. The project's objective was to determine the current quality and quantity of groundwater in the District of Columbia. To that purpose, 13 groundwater monitoring wells were installed from April to October 1992 throughout the District of Columbia to monitor and assess groundwater quality. Five wells, termed the Group A wells, were installed to determine the hydrogeologic and water quality conditions in the major hydrogeologic units in the District, i.e., the Piedmont bedrock, the Coastal Plain Potomac Group aquifer, and the terrace deposits. The other eight wells, termed the Group B wells, were installed to assess the impact of specific non-point pollution sources in the District of Columbia, i.e., community gardens and golf courses. The wells were sampled up to four times and the water analyzed for: indicator/ routine parameters, inorganics, pesticides, herbicides, volatiles and semi-volatiles. Volatiles and semi-volatiles were only of interest in the Group A wells. Preliminary results indicate that anthropogenic substances have had a limited adverse effect on the groundwater in the District. At the present time, the major limitation to potential groundwater use is the natural water quality, which is high in iron and, locally, nitrate.

The following reports have been published as part of the groundwater resource assessment:

- Background Study - DC WRRC Report No. 103
- Well Drilling and Field Operations Group A Wells - DC WRRC Report No. 126
- Well Drilling and Field Operations Group B Wells - DC WRRC Report No. 127
- Groundwater Modeling - DC WRRC Report No. 135
- Sampling and Analysis Group A Wells, Phase II - DC WRRC Report No. 136
- Sampling and Analysis Group A Wells, Phase III - DC WRRC Report No. 137
- Sampling and Analysis Group B Wells - DC WRRC Report No. 138

The final report on the project includes recommendations for managing and protecting the groundwater in the District of Columbia, was published in January 1994.
To assess the impact of stormwater on surface water quality, 148 stormwater outfalls of 36" diameter or greater, located throughout the District of Columbia, were sampled during this study. The sampling and analysis of the water was conducted in accordance with EPA recommended methods. Samples were taken from flowing water in accessible stormwater outfalls or in contiguous manholes where outfalls were submerged. Samples were collected 72 hours after rainfall of 0.1 " or greater. Two grab samples were taken at each site, each within 24 hours of each other but at least 4 hours apart. Quantitative analyses were made for flow rate, pH, copper, fluoride, surfactants (detergents)vola, phenols, and free chlorine. Qualitative analyses included color, odor, clarity and floatables. Details of vegetation growth and outfall conditions, such as structural defects, stains, and deposits, were also collected at each outfall. Concentrations for fluoride ranged from 0 to 1.2 ppm, for chlorine from 0 to 0.9 ppm, for copper from 0 to 0.15 ppm, for surfactants from 0.1 to 1.7 ppm, and for phenols from < 0.1 to 8.4 ppm. Measured flow rates varied between no flow and 1.35 cf/s, and pH values fluctuated between 6.4 and 8.4. The project was completed in the summer of 1991 and a final report was published in the fall of that year (DC WRRC Report No. 121).
20 Years of Student Training and Youth Outreach
20 YEARS OF STUDENT TRAINING AND YOUTH OUTREACH

Student Training and Youth Outreach Activities

Students are an integral part of the program of the Water Resources Research Center. They participate in a wide range of activities under the direction of faculty who serve as principal investigators of the Washington D.C. area universities. The Center recruits a number of undergraduate and graduate students as research assistants, physical science technicians, and education technicians. While the majority of the students are paid with funds from the research project grants, a number of them are paid through the Work-Study Program administered by the Financial Aid Office of the university. The background of the undergraduate students encompasses engineering, environmental science, biology, fisheries, computer science, and business. The training program enables them to learn the basics of water resources, field sampling techniques, compilation and analysis of data, etc. Graduate students work towards an M.S. or a Ph.D. degree under the supervision of a Principal Investigator working on research projects funded by the Center. Students are involved in literature search, data analysis, computer modeling and report writing. The Center also assists in placing student interns in local government and private agencies.

The Center is actively engaged in promoting water research activities in elementary and high schools where staff provides lectures, assistance and advice to student projects. Under the Water Resources Research Awards Program, the Center has significantly contributed to the motivation of students by providing judges and awards at the Annual D.C. Science Fair.
The Center also provides opportunities to students pursuing graduate programs in environmental science, and civil engineering to undertake independent and advanced degree studies under the guidance of the principal investigators. These projects also provide salaries and in-service training and references to other water and environmental agencies.

As indicated in the chart on the following page, the DC WRRC has trained to date over 170 undergraduate and graduate students. Most of these students have obtained B.S., M.S. and Ph.D. degrees in the field of water resources. The DC WRRC provides the opportunity for college and university faculty members in Washington, D.C., to develop their expertise in water resources.
<table>
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<tr>
<th>TRAINING LEVEL, TRAINING CATEGORY</th>
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<td>Ecology</td>
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<td>Fishery, Wildlife and Forestry</td>
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<td>TOTAL</td>
<td>103</td>
<td>47</td>
<td>21</td>
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</table>
SPECIAL WATER AND ENVIRONMENTAL SCIENCE PROGRAMS FOR PRE-COLLEGE STUDENTS

In an effort to promote general awareness and interest in the environmental career fields, the DC WRRC has sponsored a number of outreach programs for pre-college students in cooperation with local schools and in conjunction with other UDC programs, including: Environmental Science, Civil Engineering, Chemistry, etc.

The Youth Outreach programs include:

- A special mentor-student science program.
- An Urban Environmental Summer Study Pilot Program.
- Advisors to students for their field and laboratory projects.
- Judges for science fairs.
- Lectures and demonstrations for Elementary and High School Students.
- Special awards to high school students for water research.
- Summer Teacher Environmental Institutes in conjunction with other organizations.

STAR Program - a pilot urban watershed project at Junior High Schools and Middle Schools.
# SPECIAL WATER RESEARCH AWARDS

<table>
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<tr>
<th>Year</th>
<th>Name</th>
<th>Title of Project</th>
<th>School</th>
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<td>1987</td>
<td>Diallo K. Brooks</td>
<td>&quot;Heavy Metals Toxicity based on Hydrilla Deterioration&quot;</td>
<td>Woodrow Wilson Senior Hi</td>
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<td></td>
<td>Frederick Robinson</td>
<td>&quot;Effects of Acid Rain on Selected Metals&quot;</td>
<td>Hardy Middle School</td>
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<td>1987</td>
<td>Christopher Harris</td>
<td>&quot;Comparison of Anacostia and Potomac Rivers&quot;</td>
<td>Kramer Jr. HS</td>
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<tr>
<td>1988</td>
<td>Diallo Brooks</td>
<td>&quot;Adaptability of Potomac Hydrilla to Simulated Environmental Variables&quot;</td>
<td>Wilson Senior HS</td>
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<td>1991</td>
<td>Alexa Kruuskraa</td>
<td>&quot;Trouble in the Tributaries&quot;</td>
<td>Hardy Middle School</td>
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<tr>
<td>1992</td>
<td>Hame Dani Hooman</td>
<td>&quot;Water Project&quot;</td>
<td>Georgetown Day School</td>
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<tr>
<td>1992</td>
<td>Victoria Garner</td>
<td>&quot;Water Project&quot;</td>
<td>Woodson HS</td>
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<tr>
<td>1993</td>
<td>Hame Dani Hooman</td>
<td>&quot;Biodegradation of Hydrocarbons in Water, Decontamination of Oil Spill from the Environment&quot;</td>
<td>Georgetown Day School</td>
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<td>1993</td>
<td>Joye Rice</td>
<td>&quot;Effect of Kennilworth Mudflat Wetlands&quot;</td>
<td>Jefferson Junior HS</td>
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<tr>
<td>1993</td>
<td>Jeffrey Jones</td>
<td>&quot;The Response of Ozone Levels to Hurricane Distribution&quot;</td>
<td>Gonzaga HS</td>
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<td>1993</td>
<td>Kathryn O'Reilly</td>
<td>&quot;The Water Quality of the Anacostia River Vs. the Chesapeake Bay&quot;</td>
<td>Holly Trinity Senior HS</td>
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<td>1993</td>
<td>Kimberly Wingfield</td>
<td>&quot;Precious, Precarious and Polluted&quot;</td>
<td>Jefferson Junior HS</td>
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</tbody>
</table>

Schools are located in Washington, DC. 59
DEVELOPING A HYDROLOGIC FIELD LABORATORY FOR INNER-CITY YOUTHS

-A DC WRRC Special Project

The concept of developing a river gauge teaching laboratory in Rock Creek Park resulted from an encounter during an environmental educational event at the Patuxent Wildlife Station between Dr. Ham6 M. Watt, Director of the D. C. Water Resources Research Center (DC WRRC), and Ms. Jutta Schneider, DC WRRC research associate, and Mr. Dallas Peck, Director of the U.S. Geological Survey (USGS), and Mr. Phil Cohen, USGS Chief Hydrologist.

Their discussion about the importance of water as topic of interest to inner-city youth serving to expand their horizons led to consideration of ways to provide such outreach through collaboration between the USGS and DC institutions. The potential of adapting the Rock Creek Gauging Station to serve as a hands-on field training laboratory for school age youth in grades K through 12, as well as university students, was deemed worthy of a collaborative undertaking by the principal parties concerned, i.e., USGS, the National Park Service (NPS), DC WRRC/University of the District of Columbia, the DC Public Schools, and the DC Department for Consumer and Regulatory Affairs (DCRA).

The three objectives of the gauging station project are:

Provide inner-city students (K through #12, college and university) with a field laboratory for hydrologic studies
Create student interest in nature and the natural sciences through theoretical and practical instruction in a comprehensive watershed approach
Familiarize students, teachers and the general public with their local natural resources, and the roles and work of NPS and USGS
Technology Transfer and Information Dissemination Activities

The information transfer program covers a broad range of activities, including conferences, seminars and workshops. These meetings are now well established and attended by faculty, students and the general public. The topics are selected to reflect the District's major water issues. These topics are also based on the Center's Principal Investigators findings after completion of their research projects. Seminars also feature topics of special or current interest. The conferences usually result from joint agreement between the Center and regional agencies or professional associations. The speakers are selected from among the Center's Principal Investigators, professionals representing local/regional organizations and other special guests.

This section describes the technology transfer and information dissemination activities, including: the newsletter "Water Highlights" and the conferences organized.

The newsletter has featured the following:

- A Plan for Anacostia River Research
- Urban Land Use and Ground Water
- The Origins of Anacostia River Improvement Project - The Role of the United States Army Corps of Engineers
- Africa's Water Resources Problems
- Articles featuring Research Projects
- Articles featuring Principal Investigators
- Potomac River Clean-up
- The McMillan Drinking Water Reservoir
- Lead in Drinking Water
- Washington, D.C. Sludge Disposal Issues
- Urban Water Resources Management; Problems and Issues
- Youth Environmental Education
- Special Water Resources Outreach Programs
<table>
<thead>
<tr>
<th>NO.</th>
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<tr>
<td>1</td>
<td>May 13, 1980</td>
<td>&quot;Water Research - The Present and the Future&quot;</td>
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<td>2</td>
<td>Feb 4, 1982</td>
<td>&quot;Potomac River Overview&quot;</td>
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<td>3</td>
<td>Feb 18, 1982</td>
<td>&quot;Growth of Bacteria in Purified Waters and Its Significance as a Health Hazard&quot;</td>
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<td>4</td>
<td>Mar 25, 1982</td>
<td>&quot;The Potomac Estuary Water Treatment Plant&quot;</td>
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<td>Mar 26, 1982</td>
<td>&quot;Facing the Problem of Drought with Forecasting Techniques - The Hydrology of the Potomac River&quot;</td>
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<td>6</td>
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<td>&quot;Modeling Water Quality Without Complex Mathematics&quot;</td>
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<td>7</td>
<td>May 6, 1982</td>
<td>&quot;Wastewater Treatment for D.C.&quot;</td>
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<td>8</td>
<td>Oct 21, 1982</td>
<td>&quot;International Drinking Water Supply and Sanitation Decade&quot;</td>
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<td>9</td>
<td>Nov 4-5, 1982</td>
<td>&quot;The Potomac in Washington: Recovery, Reflection and Future Role&quot;</td>
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<td>10</td>
<td>Dec 1, 1982</td>
<td>&quot;Review of the Water Quality in the Potomac River Estuary from the 1930's to the Present&quot;</td>
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<td>11</td>
<td>Jan 26, 1983</td>
<td>&quot;Rock Creek Park&quot;</td>
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<td>12</td>
<td>Feb 16, 1983</td>
<td>&quot;Sludge Management in Washington D.C.&quot;</td>
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<td>13</td>
<td>Mar 16, 1983</td>
<td>&quot;Chesapeake Bay Program&quot;</td>
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<td>14</td>
<td>Apr 20, 1983</td>
<td>&quot;Regional Water Resource Management&quot;</td>
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<td>15</td>
<td>Oct 19, 1983</td>
<td>&quot;Microcomputers in Water Research Management&quot;</td>
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<td>16</td>
<td>Nov 17, 1983</td>
<td>&quot;Agricultural Experiment Station Program and Activities&quot;</td>
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<td>Mar 29, 1984</td>
<td>&quot;Water Supply Projects: A Case Study&quot;</td>
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<td>18</td>
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<td>&quot;Sludge management&quot;</td>
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<td>Feb 20, 1985</td>
<td>&quot;Land Applications of Sewage Sludge: A Perspective&quot;</td>
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<td>Mar 19, 1985</td>
<td>&quot;Utilization of Computer Simulation for Water Resources Management&quot;</td>
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<td>Apr 12, 1985</td>
<td>&quot;Land Applications of Sewage Sludge: A Perspective by Area Agency Representatives&quot;</td>
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<td>Apr 24, 1985</td>
<td>&quot;Environmental Career Seminar&quot;</td>
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<td>Apr 29, 1985</td>
<td>&quot;Anacostia Water Quality Trends - Past and Future&quot;</td>
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<td>June 1-2, 8-9, 14-15</td>
<td>Exhibit at the Potomac Riverfest Environ. Tent Representing WRRC/UDC Environmental Science Department.</td>
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<td>Apr 25, 1985</td>
<td>&quot;Groundwater in the Nation's Capital - Beyond Potability&quot;</td>
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<td>Feb 2, 1986</td>
<td>Field Trip to the Washington Aqueduct, Dalecarlia Water Treatment Plant</td>
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<td>Mar 18, 1986</td>
<td>&quot;Aquatic Plants in the Potomac: DistributionResearch-Management&quot;</td>
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<td>Mar 20, 1986</td>
<td>Public Display of Research Projects at UDC Science Research Day</td>
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<td>Apr 2-4, 1986</td>
<td>Field Workshop at the 5th Annual Erosion and Sedimentation Control Program Administrators Conference &quot;Landform and Soil Erosion in the Nation's Capital&quot; with paper on &quot;The Evolution of Erodible Soils&quot;</td>
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<td>Apr 6, 1986</td>
<td>Water Research Seminar at Howard University Civil Engineering Department</td>
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<td>Jun 1986</td>
<td>Exhibit at the Potomac Riverfest Envir. Tent Representing WRRC/UDC Environ. Science Dept.</td>
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<td>Oct 9, 1986</td>
<td>&quot;Pooled Fund Project: Storm Water Management Analysis System&quot;</td>
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<td>Nov 20, 1986</td>
<td>&quot;AFRICARE Water Resource Development Program&quot;</td>
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<td>Nov 21, 1986</td>
<td>&quot;Special UDC joint Seminar by WRRC and AES&quot;</td>
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37) Feb 12, 1987  "Application of Non-point Source Response Functions to General Urban Land Uses"

38) Feb 19, 1987  Joint WRRC/AWRA¹/ASCE² Symposium on "Current Water Policy Issues"


40) Apr 3, 1987  Special Symposium on "University Research on the Anacostia Rivers"

41) Apr 9, 1987  "Assessment of the Impact Chief of Stormwater of Non-Point Source Pollution on the Anacostia River: District of Columbia Portion"

42) Jun 6-7, 1987  Exhibit at the Potomac Riverfest Environ. Tent Representing WRRC/UDC.

43) Oct 22, 1987  "River Basin Management - The Case of Senegal"

44) Nov 24, 1987  "Enzymes of Hydrilla"

45) Feb 25, 1988  Joint AWRA/ASCE/WRRC Symposium on "Agri-Chemicals & Ground-Water Quality: Future Directions"

46) Feb 25, 1988  "Grant Strategies: Personal Perspectives on Granting Programs & HBCU's"

47) Mar 24, 1988  Joint COG/WRRC Symposium on "Aquatic Plants in the Potomac"

48) Jun 4-5, 1988  Exhibit at the Potomac Riverfest Environ. Tent Representing WRRC/UDC Environmental Science Department.

49) Oct 13, 1988  Anacostia River Boat Tour for Environmental Sciences Department Students


51) Nov 17, 1988  "Biopolitics and Water Management within the Tennessee Valley"

52) Nov 14, 1989  "NIH Grant Proposal Preparation"

53) Dec 04, 1989  "Sabbatical Research Conducted by Dr. J. Marion"
54) Jan 26,1990  "Research Sponsored by Agricultural Research Station"
56) Mar 3,1990  "Sabbatical Research Conducted by Dr. H. Phelps"
57) Mar 22,1990  "Department of Agriculture Proposal Preparation"
58) Apr 14,1990  "USGS Grant Proposal Preparation"
60) Nov 7,1990  Field trip to Kenilworth Gardens and the National Arboretum
61) Feb 11,1991  "Washington DC's Water Demand for the Next 20 Years"
62) Mar 04,1991  "Land Degradation and Society"
63) Mar 08,1991  Field trip to Dalecarlia Water Treatment and Blue Plains Wastewater Treatment Plants
64) Mar 21,1991  "Urban Groundwater Seminar"
65) Apr 11,1991  Field trip to Anacostia Tributary Streams
66) Oct 22,1991  "An Overview of USGS² Water Data Information System" (NAWDEX)
69) Dec 2,1992  Urban Land Use & Groundwater Vulnerability: An Approach to Environmental Equity
70) Dec 4,1992  D.C. Department of Public Works Environmental Issues
71) Feb 4,1993  Black History Month Seminar, Urban Environmental Health Research Priorities
72) Feb 25,1993  Field Trip to D.C. Water Supply and Treatment Facilities

74) Apr 23-24, 1993  UDC Earth Day Program
20 Years of Public Service
20 YEARS OF PUBLIC SERVICE

Public Service Activities

The Center has always emphasized activities relating to the development of joint cooperative efforts with D.C. government and other local agencies. These activities were in part inspired by revised bilateral and multilateral river (Anacostia) and related Chesapeake Bay restoration policies and related planning and implementing actions which provided vehicles for accelerated interaction between WRRC and a multitude of participating agencies and organizations.

The Center has over the years taken the initiative in forging coalitions with local, state, federal government agencies, educational institutions, and regional agencies and advisory bodies to solve water resources management problems and to promote improved public understanding of water-related environmental issues. These initiatives have included:

- Strengthened collaboration with the D.C. Department of Consumer and Regulatory Affairs;
- provision of assistance to the D.C. Public Works Department in assessing research plans and regulatory requirements for air and water at the Blue Plains Sewage Treatment Facility;
- assistance to the Interstate Commission for the Potomac River Basin in devising an assessment of Anacostia River research needs, proposals to institute minority business enterprise policies and programs and the establishment of graduate and undergraduate student internship programs;
- sponsorship of scientific critiques of current water management issues for the benefit of local and state government officials and members of the Congress;
- playing a key and pivotal role in assisting the Chesapeake Bay Program management in designing and executing policies and programs to correct problems associated with serious under-representation of ethnic and racial groups in Bay program participation;
- close support of other Institutes and Centers in the Mid Atlantic region in joint program planning;
- provision of advice and assistance to local citizens and environmental groups seeking to expand their knowledge of water and other environmental issues and problems in the District;
- collaboration with EPA, Howard University, the US Small Business Administration in producing a joint exhibit and consultation at an Annual Environmental Career Conference and Job Fair;
- assisting the Alliance for Space, Science and Technology and an affiliated network of local and regional groups to bring about an increase in African-American participation in the science and engineering professions; and
- the continued sponsorship of public tutorials and tours of local rivers and streams in collaboration with local community action groups.
Additionally, the Center continues to officially represent the government of the District of Columbia on the following major regional bodies:

- The Interstate Commission on the Potomac River Basin (ICPRB).
- The Chesapeake Bay Consortium.
- The Chesapeake Bay Restoration Program's Scientific and Technical Advisory Committee and newly-established mechanisms to implement region wide initiatives to broaden participation in the Bay program.
- The D.C. Soil and Water Conservation District Commission.

**Affiliations**

The consortium of universities participants in DC WRRC sponsored projects include:

American University
Catholic University of America
Georgetown University
George Washington University
Howard University
University of the District of Columbia

The consortium of the universities, which cooperates with the Water Center, comprises about 78 faculty members with expertise in more than 74 water-related disciplines. Faculty members are listed in the Directory of Water Expertise (DC WRRC Report # 142).

The DC-WRRC is a member of the following professional associations:

NIWR (National Institutes of Water Resources)
IWRA (International Water Resources Association)
AWWA (American Water Works Association)
AWRA (American Water Resources Association)
WEF (Water Environment Federation)
NGWA (National Ground Water Association)

The Center is affiliated and/or in close cooperation with the following organizations:

D.C. Department of Consumer & Regulatory Affairs
National Science Foundation- Engineering Division
D. C. Department of Recreation
D.C. Department of Public Works
Anacostia Watershed Society
U.S. Army Corps of Engineers
Interstate Commission on the Potomac River Basin
Greater Washington Board of Trade
Maryland Department of Natural Resources
Department of Chemistry- American University
The Catholic University of America
Department of Engineering- University of the District of Columbia
U.S. National Park Service
U.S. Geological Survey
Department of Environmental Science- University of the District of Columbia
Chesapeake Bay Program- Environmental Protection Agency
Department of Civil Engineering- Howard University
Water Pollution Control Branch- D.C. Dept. of Consumer & Regulatory Affairs
Soil Conservation Branch- D.C. Dept. of Consumer & Regulatory Affairs
National Association for Equal Opportunity in Higher Education (NAFEO)
DC's Citizen Environmental Advisory Panel
Appendix A
Mrs. Dorothy Barton
Division of Curriculum & Educational Technology
Langdon Elementary School 20th & Franklin Streets, N.W. Washington, D.C. 20018

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Administrator, Environmental Regulation Administration
D.C. Department of Consumer & Regulatory Affairs
2100 Martin Luther King, Jr. Avenue S.E. Washington, D.C. 20020

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Appendix B
# List of Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA-</td>
<td>Academic Affairs (UDC)</td>
</tr>
<tr>
<td>AWRA-</td>
<td>American Water Resources Association</td>
</tr>
<tr>
<td>A-</td>
<td>American Water Works Association</td>
</tr>
<tr>
<td>CLS-</td>
<td>College of Life Sciences (UDC)</td>
</tr>
<tr>
<td>COE-</td>
<td>Corps of Engineers</td>
</tr>
<tr>
<td>COG-</td>
<td>Council of Governments</td>
</tr>
<tr>
<td>DCRA-</td>
<td>Department of Consumer and Regulatory Affairs</td>
</tr>
<tr>
<td>DOI-</td>
<td>Department of the Interior</td>
</tr>
<tr>
<td>EPA-</td>
<td>Environmental Protection Agency</td>
</tr>
<tr>
<td>FCWA-</td>
<td>Fairfax County Water Authority</td>
</tr>
<tr>
<td>FDA-</td>
<td>Food and Drug Administration</td>
</tr>
<tr>
<td>HCDN-</td>
<td>Hydro-Climatic Data Network</td>
</tr>
<tr>
<td>ICPRB-</td>
<td>Interstate Commission on the Potomac River Basin</td>
</tr>
<tr>
<td>IWRA-</td>
<td>International Water Resources Association</td>
</tr>
<tr>
<td>LR-</td>
<td>Learning Resources (UDC)</td>
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<tr>
<td>MOU-</td>
<td>Memorandum of Understanding</td>
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<tr>
<td>NAWDEX-</td>
<td>National Water Data Exchange</td>
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<tr>
<td>NBS-</td>
<td>National Biological Survey (DOI)</td>
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<tr>
<td>NGWA-</td>
<td>National Ground Water Association</td>
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<td>NIWR-</td>
<td>National Institutes of Water Resources</td>
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<td>NPDES-</td>
<td>National Pollutant Discharge Elimination System</td>
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<tr>
<td>SDWA-</td>
<td>Safe Drinking Water Act</td>
</tr>
<tr>
<td>STORET-</td>
<td>STOrage and RETrievial (computerized database)</td>
</tr>
<tr>
<td>UDC-</td>
<td>University of the District of Columbia</td>
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<tr>
<td>USDA-</td>
<td>US Department of Agriculture</td>
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<tr>
<td>USGS-</td>
<td>United States Geological Survey (DOI)</td>
</tr>
<tr>
<td>WATSTORE-</td>
<td>WATer Data STOrage and RETrievial System</td>
</tr>
<tr>
<td>WEF-</td>
<td>Water Environment Federation</td>
</tr>
<tr>
<td>WMA-</td>
<td>Washington Metropolitan Area</td>
</tr>
<tr>
<td>WRRC-</td>
<td>Water Resources Research Center</td>
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<tr>
<td>WRSIC-</td>
<td>Water Resources Scientific Information Center</td>
</tr>
<tr>
<td>WSSC-</td>
<td>Washington Suburban Sanitary Commission</td>
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</tbody>
</table>