

ASCE

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of Civil Engineers



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ASCE Illinois Section

News

Vol. 40, No. 3
March 1999

New Software for Hydrologic and Hydraulic Modeling

A near real-time streamflow-simulation system, utilizing continuous-simulation rainfall-runoff generation with dynamic-wave routing, has been developed by the U.S. Geological Survey in cooperation with the DuPage County, Department of Environmental Concerns for a 24-kilometer stretch of Salt Creek in DuPage County, Illinois. This system is needed in order to more effectively manage an off-line storm-water diversion reservoir, such as the Elmhurst Quarry located along Salt Creek.

The first version of the GENERation and analysis-of-model simulation SCeNarios (GenScn) interactive software tool for plotting, listing, producing statistics, and animating the results of the continuous-simulation rainfall-runoff model, Hydrologic Simulation ProgramBFORTRAN (HSPF) and the dynamic-wave hydraulic model Full Equations (FEQ), has been released by the U.S. Geological Survey. The program, distributed as a Microsoft Windows 9x/NT application, functions as a model builder for HSPF and can be used to view and animate input data as well as HSPF and FEQ model outputs. GenScn uses MapObjects LT for map display of data locations and a HSPF Watershed Data Management (WDM) binary database. DuPage County, Department of Environmental Concerns has been actively involved in designing and implementing the GenScn interface. A prototype version has been applied to the Lower Salt Creek as a near real-time streamflow-simulation system.

Hydrologic and hydraulic model simulations of Lower Salt Creek have indicated that the timing of the flood wave in the watershed is highly sensitive

to the temporal and spatial distribution of rainfall. Consequently, the capability to generate scenarios in near real-time is a useful tool to help evaluate and make effective decisions about diversions or return flows.



With the GenScn interface, alternative strategies for diversion structures can be evaluated and compared prior to taking action. Additionally, to perform rapid hydrologic and hydraulic simulations needed for operational modeling, automated methods are needed for data retrieval, conversion, error-checking, data estimation, and storage. The automated data retrieval tools also are being developed by the U.S. Geological Survey and DuPage County, Department of Environmental Concerns and are currently independent of the GenScn interface, although GenScn continues to be utilized to enter the converted data into

the WDM database.

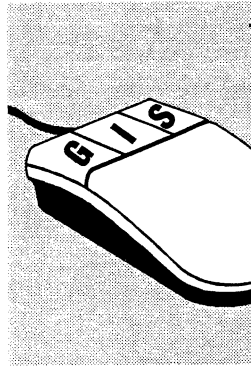
The continuous simulation rainfall-runoff model used in DuPage County, HSPF, has been enhanced to meet the unique needs of the near real-time streamflow-simulation mode. HSPF 12.0 now writes the final simulation conditions to a file, thereby eliminating the need to manually enter the final conditions as initial state variables for the subsequent simulation runs. Individual data sets within the WDM can be time-stamped for future reference. The capability to output a binary time-series file (TSF) of unit runoffs suitable for direct input as lateral inflows to the one-dimensional, unsteady-flow hydraulic routing model, FEQ, has been added to HSPF.

The FEQ model solves the full dynamic equations of motion for one-dimensional, unsteady

(continued on page 3)

GIS Implementation

GIS, or Geographical Information Systems, is a wonderful tool used to analyze geographical data. GIS is a computer system designed to allow users to collect, manage, and analyze spatially referenced and associated attribute data. They are used for solving research, planning, and management problems. The most significant components of a GIS are an interface, database management, database creation, data-entry capacity, spatial data manipulation, and a display function. GIS allows for multiple layers of geographic data to be viewed and analyzed simultaneously. The computer allows for analysis to be done in a much faster and more efficient way than with paper maps. With com-



GIS allows for multiple layers of geographic data to be viewed and analyzed simultaneously.

puter analysis comes a better-informed decision-maker.

Whether you work in the public or private sector, GIS can apply to you or your organization to save time and money. GIS is being used for a variety of purposes.

Some of the most common people involved with GIS are as follows: civil engineers, police officers, business people, planners, property owners, and individuals in the academic community. GIS can improve the quality of life in your Village or City. GIS is exciting because it is revolutionizing how we work.

Some of the areas in which GIS can be utilized are as follows: site development planning; site management, suitability analysis, development site selection, resource potential, land use plans, natural resources management, habitat analysis, forest management, land conservation, planning, impact analysis, transportation analysis, economic development, routing, and crime/accident/fire analysis.

To be able to cover all bases of GIS would take years. When GIS was in its infancy 35 years ago, few researchers used it. It was a rare occasion to have the opportunity to study GIS concepts and participate in the proper computing environment. Today, you cannot go anywhere without the use of a computer. Because of this widespread use of computers, they are becoming more powerful and less expensive, making GIS a reality to smaller organizations.

Organizations pondering the implementation of GIS need to be aware of different GIS software products during system selection. GIS software has evolved very rapidly over its brief history. A variety of issues should be considered during the purchase selection. The following is a list

of some of the possible implementation and operational considerations: cost (personnel, hardware, software), upgrades (annually), LAN configuration support (Microsoft/Novel), training costs and continuing training needs, ease of installation, maintenance of hardware and software, documentation and manuals, user support, and staffing workforce needed.

There is a variety of GIS software from which to choose. One of the leading vendors is Environmental Systems Research Institute, or ESRI Inc. of Redlands, California. In the process of choosing which GIS software is right for you, you should analyze your surroundings to see what other organizations are using. When similar organizations are using the same software products, there is less concern for data compatibility problems. Although data compatibility issues have recently become less of a concern, it is better to need less data tweaking.

In Lake County, Illinois, The Village of Vernon Hills analyzed the County's current software situation and recognized a shift to ESRI products. The Chicago metropolitan area is a very strong user of ESRI products. Cook County has recently decided to take the plunge into full GIS implementation. Their software of choice is ESRI's suite of GIS products, ArcInfo and ArcView. ESRI offers numerous products that will fulfill almost any GIS need.

Selecting a GIS can be a complex and confusing process. An intelligent GIS consumer should research, select, test, and question the systems before purchase. Outside assistance is a possibility when attempting to assess your individual need for GIS technology. There are GIS consulting services that will be more than willing to do a complete GIS analysis for your organization to help you decide whether or not GIS will be beneficial.

For more information about GIS and other topics affecting the civil engineering profession, please attend the Urban Planning and Development Group's next meeting at 7:30 am on March 18, 1999 at Denny's Restaurant in OakBrook Terrace.

—By Brent T. Kastor, GIS Specialist
The Village of Vernon Hills

ASCE Illinois Section News

ILLINOIS SECTION NEWSLETTER

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Illinois Section - Zone III - District 8

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Web Site: <http://www.mcs.net/~isasce/>

Submission deadline for the April Newsletter is March 11, 1999

New Software for Hydrologic and Hydraulic Modeling

(continued from page 1)

flow in open channels and through control structures. An option has been added to FEQ that writes simulated results to a file accessible by GenScn. The output parameters include discharge, water-surface elevation, top width, flow area, storage, conveyance, and others, and can be plotted at any output node or branch in the model, either as a time series at a point, or as a profile of one or more branches.

GenScn was originally developed to meet the need for a user friendly interface to enable rapid modification of HSPF inputs and rapid analysis of the output. The system has been utilized with the HSPF RCHRES routing routines in the Truckee and Carson River Basins in California and Nevada.

The routing of owned parcels of water is tracked with multicolored profile plots and map animations. The system has also been used to simulate water quality in the Patuxent watershed in Maryland. The current version is written in Microsoft VisualBasic 5.0. An ESRI shapefile depicting the data locations, and a WDM database are required to display time-series data. A version of HSPF is included with the GenScn distribution and is implemented as a dynamic link library.

GenScn may be obtained from the USGS software World Wide Web site at <http://water.usgs.gov/software/GenScn.html> or by ftp from [water.usgs.gov](ftp://water.usgs.gov) (path: /pub/software/surface_water/genscn). Version 1.0 is limited to one FEQ profile. A new version, which interpolates FEQ time series to allow multiple animated profiles and other features, is being tested and will be available soon. (The use of trade names in this article is for informational purposes only, and does not imply endorsement by the U.S. Geological Survey or DuPage County, Department of Environmental Concerns.)

President's Notes

John O'Holleran

Attorneys representing two engineering firms in litigation regarding an environmental site remediation project have recently approached ASCE. The project involved the remediation of a decommissioned utility property, which was contaminated with coal tar. The Illinois EPA oversaw the investigation and remediation of the site.

In this case, four families alleged that the chemicals emitted during remediation of the property resulted in a cluster of rare childhood cancer incidents in the small central Illinois community. The families, on behalf of their children, sued the two engineering firms and the utility company. The suit claimed the engineering firms violated the engineering standard of care in the services provided on this project.

During the trial, the plaintiff and defendants both provided expert witness testimony regarding the issue of 'standard of care' for this project. The plaintiff also cited numerous documents, including US EPA documents, to allow the jurors an opportunity to determine for themselves the definition of 'standard of care' for this case.

The court, in its instructions to the jurors, stated that the plaintiff must establish through expert testimony that an appropriate standard of care was not utilized in the remediation of this property. The plaintiff argued that the jurors should be allowed to establish their own interpretation through the review of the documentation provided. After deliberation, the verdict supported the engineering firm's performance on the project.

The case is now in appeal before the Appellate Court of Illinois. One of the grounds of appeal is the issue of interpretation of the 'standard of care' as it applies to this case and the reliance on expert witness testimony. The engineering firms have been brought back in to the case.

The results of this case will establish far-reaching precedent in the ability of our profession to meet the needs of society. If professional engineers are to be held to a variable standard that is subject to inconsistent interpretation,

we will be unable to complete the simplest of projects without fear of liability. The expectation that a jury of randomly selected individuals should be expected to provide a better judgement on the performance of our services than our peers is frightening.

As a result of this appeal, the defendants have requested that ASCE and other professional societies consider filing an amicus curiae brief in support of the professional engineers involved in this case. I believe ASCE and the Illinois Section will come out strongly in support of this brief. Our ability to perform our services in a rational environment is threatened. It is time to get off the sidelines and take an active role in defining our profession.



Wind Loads for cladding got you **UP IN THE AIR?**

Learn from an expert
on ASCE 7 - 99
Section 6 Wind Loads.

- WHO:** Jim Delahay, P.E.,
a member of the ASCE 7
Wind Load Task Group
- WHAT:** Presentation of the
windload provisions of
ASCE 7 -99 for Components
and Cladding
- WHERE:** 1999 Window and Door
Manufacturer's Technical
Conference
Ramada Plaza Hotel O'Hare
- WHEN:** May 5, 1999

Registration is available for members of ASCE. For information call Noel Arens at WDMA Headquarters, (847)-299-5200.

Illinois Section News & Secretary Report

In an effort to better inform ASCE Illinois Section Members of Board Meeting discussions and Section activities, the Section Secretary will be contributing this monthly article to the newsletter. Any feedback on the Section activities or membership needs is welcome and can be sent to the Section office address noted on the Newsletter's editorial section on page 2.

Each Section Group reported on their past month's activities and future group meetings as noted in the Section Activities portion of the newsletter. Highlights of future Group activities are as follows:

■ Group Reports

▲ The Geotechnical Group had 46 attendees (including 9 students) at

their January 12 dinner meeting, a joint meeting with AEG. The featured speaker was Dr. Terry West of Purdue University who presented a review of rock slope stability. They are planning their next dinner meeting on February 10 at the Como Inn. The featured speaker will be Dr. Jim Lindell of Harza Engineering, who will speak on the rehabilitation of the Lake Shore Drive Water Supply Tunnel.

▲ The Environmental Engineering and Water Resources Group had seven attendees at their January 12 monthly group meeting at the offices of Christopher B. Burke Engineering Ltd. In addition, EE&WR had three members volunteer to act as judges at the Future Cities Competition. The group

is in the process of contacting ASCE Student Chapter Presidents at the three member universities (NU, IIT, UIC) to promote a \$1,000 scholarship. The group is currently planning a HEC-RAS seminar (May 12-14), a river geomorphology course (May), a HEC-HMS seminar (June 9-11), and an Advanced FEQ seminar (April).

▲ The Urban Planning & Development Group had eight attendees at their group meeting on January 21 at Denny's in Oakbrook Terrace. The group designated their Vice Chair to be the group's designated representative on the section's nominating committee each year. They reviewed a rough draft of the secondary article for the March newsletter. A joint venture with the Lake County APWA has been postponed until spring of 2000. The group will pursue their own seminar in the summer of 1999.

▲ The Younger Member Group had their largest turnout of the year — 36 attendees — at their January 20 meeting featuring the New River Gorge bridge inspection and bungee jump, by Bill Amrhein of Baker Engineering. The group is planning an evening presentation on February 25 by Mr. Steve Schultz, President of Writing at Work. The presentation will be an abbreviated version of Mr. Schultz's full-day seminar on March 26.

▲ The Transportation Group had 30 attendees at their January 21 luncheon presentation given by Mr. Jim Wolfe of AMTRAK. His talk focused on the Midwest Regional Rail Initiative. The group is planning a luncheon meeting on March 18 featuring DuPage County Director of Transportation Chuck Tokarski.

■ Additional Section Business

▲ Director Krepfl, on behalf of the Student Affairs Committee, attended two student chapter meetings last month (Northwestern University and IIT). She expected that several student chapters would be attending the next Board meeting with requests for funds.

STREAM GEOMORPHOLOGY & RESTORATION TECHNIQUES SEMINAR

"An Introduction"

Sponsored by:

Kane County
Department of
Environmental
Management
and the
Environmental
Engineering &
Water Resources
Group (EE&WR)

DATE: May 13-14, 1999
TIME: Sessions begin at 8:00 a.m.
both days
PLACE: May 13, 1999 at
Elgin Community College
May 14, 1999 at
Leroy Oak Forest Preserve
in St. Charles

SUMMARY: Two centuries of development have converted vast prairie and natural streams to agriculture, then converted again to urban use. Our waterways have been transformed by dams, channelization, dredging and other modifications. This seminar will examine the impact of these changes on our waterways and introduce principles for understanding and improving our streams. New and evolving principles of stream geomorphology will be presented, which are vital to protecting, preserving and improving our waterways. The first day will be a series of lectures by local and state government officials, academic professionals, and private consultants. The second day will consist of "hands on" lectures at the Leroy Oak Forest Preserve.

CONTACT: Thomas Burke at
Christopher B. Burke Engineering, Ltd.
(847) 823-0500 or
Email: cbbel@meginet.net

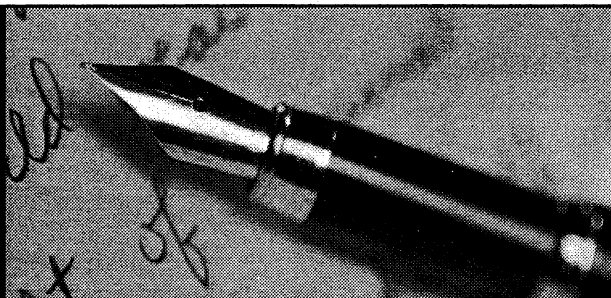
▲ Director Krepfl, on behalf of the Annual Dinner Committee, has contacted the Chicago Hilton and Towers to determine prices for the event. It was determined that the 9.75% tax would not apply to us. Committee member Wittmer also presented a list of facilities that he called to determine prices. A discussion concerning the location of the 1999 annual meeting and the urgency to make a final decision took place. President O'Holleran asked that the committee contact a few more places and then make a decision. The decision could be made before the next meeting and a conference call would take place, if need be, to make the final decision.

▲ Past-President Allen Staron presented a report on the Government Affairs Coalition Committee, whose mission is to combine the efforts of the three ASCE sections in Illinois and pursue matters of mutual interest in State government. The report presented background information on the committee, its activities to date, and a recommended action plan to resurrect interest in, and expand involvement in, this somewhat dormant but potentially important committee.

▲ The web-site advertising policy, which was approved at December's meeting, was submitted. Director Trojjan will try to have an advertisement for this service in next month's Newsletter.

—By Cleighton Smith, Secretary

Technical Writing for Engineers Seminar



As engineers, we all write everyday. Whether writing memos, letters, reports or specifications, we all need to write to our audience clearly and professionally. Dr. Steven Schultz is the President of Writing at Work. In addition to designing and directing the company's writing programs, he also writes and edits educational, technical, and corporate publications. Dr. Schultz will lead you through examples of how to write clear, concise, organized, and tactful messages.

Time: 8:00 a.m. to 5:00 p.m.

Cost: \$175.00

Includes: Writing at Work Workshop Manual
Continental Breakfast
Box Lunch
Afternoon Snack

Register by March 19, 1999. Space is limited, so ASCE members will have priority.

For more information, contact Lisa Harbert at 773-775-4009 or chicago@ciorba.com.

*Friday
March 26, 1999*

*111 N. Canal
(River Center)
1st Floor Conference
Room, Chicago*

TECHNICAL WRITING FOR ENGINEERS SEMINAR

Participant Name: _____

Company: _____

Address: _____

Phone: _____ Fax: _____

E-mail: _____

ASCE Member No. _____

Send check and form to: Lisa Harbert
Ciorba Group, Inc.
5507 N. Cumberland Ave.
Chicago, IL 60656

Please make checks out to: ASCE YMG

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Naperville, Illinois • May 17-19, 1999

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Mike Murphy at Northeastern Illinois
Planning Commission
(312) 454-0400 (312) 454-0411 (Fax)
murphy@nipc.org

Sponsored by:
Northeastern Illinois Planning Commission
ASCE Environmental Engineering and
Water Resources Division

Section Activities

Environmental Engineering & Water Resources Group

The Executive Committee of EE&WR meets the second Tuesday of every month. We always welcome new faces and ideas. If you are interested in becoming more involved with planning activities related to environmental and water resources engineering, please contact Thomas Burke (see number below). We are currently organizing several upcoming seminars:

FEQ Seminar

EE&WR, DuPage County DEC and the USGS are sponsoring a seminar on the Full Equations (FEQ) computer model for experienced users of FEQ. The seminar is scheduled for May 19-21, 1999 at the DuPage County Government Center. Contact Eric Loucks at (312) 474-4309 for additional information.

HEC-RAS May 12-14, 1999
HEC-HMS June 9-11, 1999

For further information about the HEC courses, contact David Moughton at (630) 213-7395. Registration deadline for both HEC courses is April 16, 1999.

Stream Geomorphology & Restoration Techniques Seminar

Kane County DEM and EE&WR are sponsoring this 2 day seminar that will include one day of lectures and one day of "hands on" training at two sites. For further information please contact Thomas Burke.

Next Regular Meeting:

Date: March 9, 1999

Time: 5:30 p.m.

Place: Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road
Suite 600
Rosemont, Illinois

Info: Thomas Burke
(847) 823-0500

Geotechnical Group

Geotechnical Group meetings are normally held every second Tuesday of the month, September through May.

Time: 5:30 pm Social
6:30 pm Dinner
7:30 pm Presentation

Place: Como Inn Restaurant
546 N. Milwaukee Avenue
Chicago, Illinois

Cost: \$25 with reservations
\$30 at the door
\$10 for students with reservations
\$15 for faculty with reservations

RSVP: Barb Pries at (312) 263-1606
by Friday, March 5, 1999

March Meeting

The March meeting will be held on Tuesday, March 9, 1999 at the Como Inn in Chicago. Tom Wysocky of Thatcher Engineering Corporation will speak on "How to Eliminate the Use of Caissons and Transfer Girders in Your Design by Using Piling".

Younger Member Group

March Dinner Meeting

"Damen Avenue Arch Bridge—
A Signature Bridge for the
City of Chicago"

The City of Chicago has recently replaced a severely deteriorated bascule bridge over the North Branch of the Chicago River with an innovative half-through arch. The bridge is part of a \$12.6 million dollar improvement project along a section of North Damen Avenue between Fullerton and Diversey Parkway. This structure spans 94 meters over the river and carries 4 lanes of traffic and a sidewalk on each side.

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Epstein Civil Engineering provides a wide range of planning, design, and construction services for the industrial, commercial and transportation areas of Civil Engineering.

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Opportunities

The two ribs are fabricated from circular structural steel tubing that is formed into an arch shape by induction heat bending. The ribs are designed without lateral bracing in order to emphasize their form and create an open atmosphere for the motorists and pedestrians who will utilize the structure. This bridge was recently featured in the February issue of Civil Engineering magazine in the article, "Bridging Substance with Style".

Mr. Pat Cassity, Senior Bridge Engineer with J. Muller, International, will present the key aspects of the bridge design and describe the construction sequence and methods employed to build this unique structure.

Date: Thursday, March 18th, 1999

Time: 5:30 pm

Place: HNTB—
1st Floor Conference Room
111 N. Canal Street
Chicago, Illinois

Cost: \$12

RSVP: Ken Smorynski
(312) 616-7408

Call for Volunteers

Christmas in April takes place on Saturday, April 24th and YMG has agreed to call for volunteers to rehabilitate a home in Chicago at 3922 W. Flounoy. No financial support is needed since the home is being sponsored by Amoco. The recent merger of BP-Amoco and subsequent downsizing of Amoco's Chicago operations, has left two of Amoco's four sponsored homes understaffed. Therefore, at this time YMG is calling for volunteers from the Illinois Section to help with this worthwhile charitable event. Contact Christopher Dicks by phone at 773-380-7956 or E-mail at cdicks@hdrinc.com to sign up or for additional information.

April Meeting: Des Plaines River Wetlands Demonstration Project

Transportation Group

March Dinner Meeting

Current Transportation Projects in DuPage County

Speaker: Mr. Charles Tokarski, P.E.
Director of Transportation
DuPage County Division
of Transportation

Chuck Tokarski will be the speaker at the Transportation Group's March dinner. Mr. Tokarski will discuss current transportation problems and projects within the County. Particular emphasis will be on projects being contemplated or recently begun.

Date: Thursday, March 18th, 1999

Time: 5:30pm-6:00pm Social

Social: 6:00pm Dinner
6:30pm Presentation

Place: Truffles Grove Restaurant
360 N. Rohlwing Road
Itasca, IL 60143
Phone: 630-773-9650
Free Parking

Cost: \$25.00/ Students \$15

For reservations, please call Huron Winstead at (847) 279-2466 or Peter Johnston at (773) 399-0112 by Friday, March 12, 1999.

Urban Planning & Development Group

Concerned about important issues confronting the civil engineering profession? Visit our next meeting to discuss these items with fellow civil engineers involved in government, private practice, construction, consulting, and other disciplines. Please contact Jeff Gutowsky at (847) 895-3640.

Group meetings are held every third Thursday of the month. The back room at Denny's Restaurant has been reserved for the Group. Our next scheduled meeting is:

Date: March 18, 1999

Time: 7:30 a.m.

Place: Denny's Restaurant
17 West 660 22nd Street
Oakbrook Terrace, Illinois
(630) 932-1888

Structural Group

There will be no Structural Group dinner meetings in March and April in lieu of the Structural Group Lecture Series.

DCCA Workshop

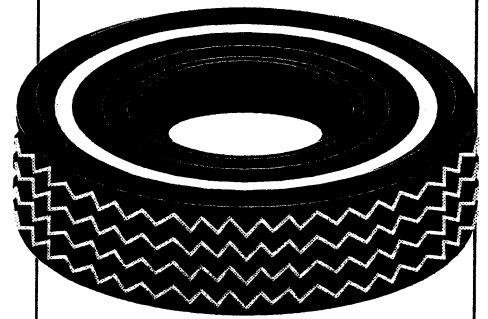
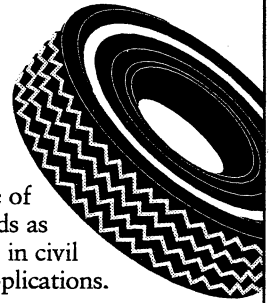
The Illinois Department of Commerce and Community Affairs'

Bureau of Energy and Recycling is sponsoring two workshops to discuss the use of scrap tire shreds as lightweight fill in civil engineering applications.

Tire shreds are scrap tires that have been cut into 1 - 12 inch pieces. They are excellent fill material since they are lightweight, a good thermal insulator, free draining, and produce low lateral pressure on walls.

The instructor for these one-day sessions is Dr. Dana Humphrey of the University of Maine, Orono. He has conducted extensive research on the use of scrap tire shreds in highway applications and has presented workshops on this and related topics throughout the United States. Civil engineers, highway superintendents and contractors who want to learn how to improve project quality and reduce costs should plan to attend one of these free workshops.

The two workshop locations and dates are the Oak Brook Hyatt Regency, 1909 Spring Road, Oak Brook, IL on March 30, 1999 and the University of Illinois at Springfield, Shepherd Road, Springfield, IL on March 31, 1999. Lunch will be provided at no cost. For more information or to register, please contact Alan Justice at 217-785-3999.



HEC-RAS & HEC-HMS *Short Courses*

Sponsored by EE&WR Technical Group

HEC-RAS *May 12-14, 1999*

HEC-RAS steady flow river hydraulics model
At Schaumburg IDOT

HEC-HMS *June 9-11, 1999*

HEC-HMS rainfall hydrology model
At Schaumburg IDOT

Registration Deadline is April 16, 1999. Make checks for \$495 per person, per class payable to ASCE, EE&WR
Mail registration to: David Moughton, ASCE, IL Section, Room 1000, 203 North Wabash Ave., Chicago IL 60601
Or call (630) 213-7395.

HEC-RAS & HEC-HMS

Short Courses

Name: _____ Phone: _____

Address: _____

Organization: _____

Check applicable class HEC-RAS HEC-HMS

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