



# WATERSHED MANAGEMENT SYMPOSIUM 2015

Reston, VA | August 5-7

Final Program



## Power of the Watershed

Restore healthy lifestyles, provide quality living, and support vibrant economies while maintaining a diverse ecosystem.

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## Welcome Note

### Hosted by the ASCE Environmental and Water Resources Institute at ASCE Headquarters 1801 Alexander Bell Drive, Reston, VA

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This year marks the 50th Anniversary of the Watershed Management Symposium, which has been held at five-year intervals since 1965. The rich history of this conference has brought together engineers, hydrologists, soil scientists, foresters, environmentalists and a variety of other disciplines for quality technical presentations and great networking opportunities. This year, attendees will meet in the metropolitan Washington, D.C. area among the decision-makers on sensitive watershed issues and in the midst of the Potomac and Chesapeake Bay watersheds.



**ENVIRONMENTAL &  
WATER RESOURCES  
INSTITUTE**



#### EWRI STAFF

Brian K. Parsons, M. ASCE, Director  
Gabrielle Dunkley, Manager  
Veronique Nguyen, Coordinator  
Mauren Maldonado, Administrator



## Conference Chairs

### Donald M. Phelps, P.E., D.WRE, M.ASCE Conference Co-Chair



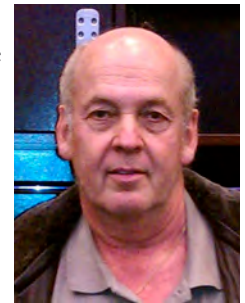
I left New Hampshire at 20 years old in 1968 with everything I owned in two packing trunks in the back of my El Camino and 180 dollars in my pocket heading for Alaska. Ran out of money in Washington and went to work for the US Forest Service for the next 10 years and then back to Washington State University for a pair of engineering degrees, then off to Mountain Empire Community College in Virginia to teach engineering and environmental science for 2 years before moving on to New England College

in New Hampshire to teach civil engineering classes. Went into the consulting field in 89 and moved back to Washington State (Lake Chelan) in 91.

In 2005 my wife and I started a winery with me growing the grapes and she making the wine. In the 30 years since I left Washington state I volunteered as much time as I possibly could to the benefit of ASCE and EWRI, serving on numerous committees starting in 1983; chairing multiple conferences; holding leadership roles in Section activities, the ASCE Board of Direction and EWRI. It has been a great life and I am looking forward to many more vintages at Hard Row to Hoe Vineyards (PS I still have the trunks!)

### Dr. Donald Frevert, F. ASCE, P.E., D.WRE Technical Program Chair

Dr. Donald Frevert, F. ASCE, P.E., D.WRE, is a retired Hydraulic Engineer from the Bureau of Reclamation and the incoming Vice Chair of the EWRI Watershed Council.



During his 29 years with Reclamation, he served as a co-lead on development and implementation of water resources decision support systems used to operate a number of major river basins and facilities including Hoover and Glen Canyon Dams.

Don represented Reclamation on the Federal Interagency Subcommittee on Hydrology from 1998 through 2008 (Chair 2003-2005). He served as Technical Co-chair for the first and second Federal Interagency Hydrologic Modeling Conferences (1998 and 2002) and as General Chair for the 3rd and 4th Federal Interagency Hydrologic Modeling Conferences (2006 and 2010). He was Technical Co-chair of EWRI's Watershed Management Conference in 2000 and 2010.

Don earned his Bachelor's Degree from the University of Arizona and his MS and Ph.D. from Colorado State University. He is a Professional Engineer in Colorado (since 1976) and has been an ASCE member since 1975. He has served on the Watershed Management Technical Committee since 1994 (Chair 2001 - 2003). He is an Associate Editor of the Journal of Hydrologic Engineering (since 2007).

## Conference Chairs

### Glenn E. Moglen, Ph.D., P.E., F. ASCE Proceedings Editor



Glenn E. Moglen earned his BSCE at the University of Maryland in 1987, his MSCE at Colorado State University in 1989, and Ph.D. from the Massachusetts Institute of Technology in 1995. Dr. Moglen was a Research Hydrologist at that National Weather Service, Office of Hydrology in Silver Spring, MD from 1995-1996.

In 1996, Dr. Moglen joined the University of Maryland, Department of Civil and Environmental Engineering, earning tenure in 2002. In 2003-2004, he spent a sabbatical at the US Geological Survey, Office of Surface Water in Reston, VA, publishing a new technique for urban flood estimation as a USGS Scientific Investigations Report.

In 2008, Dr. Moglen joined Virginia Tech as a full professor in the Charles E. Via, Jr., Department of Civil and Environmental Engineering. Dr. Moglen served as the Program Director for his department's National Capital Region program from 2012 to 2014. In 2014, Dr. Moglen became the Director of the Occoquan Laboratory in Manassas, Virginia.

Dr. Moglen has authored more than 45 journal articles, several book chapters, and served as editor of now two ASCE proceedings. He is the author of the recent book, *Fundamentals of Open Channel Flow*, published in April 2015 by the CRC Press. Many of his journal publications focus on themes of urban hydrology, floods, land use and climate change effects, and water supply. Dr. Moglen has been a member and officer within the ASCE Watershed Management technical committee since 2003.

### Claudia C. Hoeft, P.E., M.ASCE Short Course/Workshop Chair



Claudia C. Hoeft, P.E., M.ASCE, is currently the National Hydraulic Engineer at the USDA - Natural Resources Conservation Service (NRCS). Since 1991, Claudia served as a hydraulic engineer with NRCS in Missouri and Indiana, and as a national technical specialist while in Little Rock, Arkansas, prior to taking her current position in 2005. She coordinates the development of technical guidance and training materials and represents NRCS on numerous interagency working groups and committees. A member of ASCE since a student at the University of Missouri-Rolla in 1988, Claudia has been an active member of the EWRI/Watershed Management Technical Committee (WMTC) since 2006, and served ASCE as secretary, vice-chair, and now chair of the WMTC since 2010. She has authored or edited several chapters in the NRCS National Engineering Handbooks (NEH) on Snow Survey and Water Supply Forecasting and Hydrology. Most recently, she worked with WMTC and ASCE representatives to develop a Memorandum of Understanding (MOU) to establish a framework for cooperation between NRCS and ASCE and a cooperative agreement between NRCS and ASCE to update several chapters in the NRCS NEH on Hydrology.



## Schedule at a Glance

### Proceedings

**NEW**

As an exclusive benefit for all symposium registrants, online access to the complete proceedings will be available in the ASCE Library for 60 days beginning on the first day of the Conference:

<http://ascelibrary.org/page/watershedproceedings>

### Transportation

A private shuttle service will be available to transport attendees from the Sheraton Reston Hotel to the Bechtel Conference center at ASCE Headquarters for the symposium. You may view the shuttle schedule at

<http://watershedmanagementconference.org/location/lodging-transportation/>

## Watershed Management Symposium Organizing Committee

David Watkins, Ph.D., P.E., M.ASCE, Michigan Technological University

Michael Chelminski, P.E., M.ASCE, Stantec Consulting Services, Inc.

Don Woodward, P.E., F.ASCE

Pete Hawkins, Ph.D., P.E., F.ASCE, F.EWRI, University of Arizona

Ranvir Singh, P.E., M.ASCE

Paul Kirshen, Ph.D., M.ASCE, University of New Hampshire

### Wednesday, August 5, 2015

Time	Event
7:30 a.m. – 5:00 p.m.	Registration
8:30 a.m. – 5:00 p.m.	Plenary Sessions
10:00 a.m. – 10:30 a.m.	Networking Break
12:00 p.m. – 1:30 p.m.	Luncheon
3:00 p.m. – 3:30 p.m.	Networking Break
5:30 p.m. – 7:00 p.m.	Reception - You are invited to attend the Opening Reception in the Bechtel Conference Center.

### Thursday, August 6, 2015

Time	Event
7:30 a.m. – 5:00 p.m.	Registration
8:30 a.m. – 5:00 p.m.	Technical Sessions & Workshops
10:00 a.m. – 10:30 a.m.	Networking Break
12:00 p.m. – 1:30 p.m.	Luncheon
3:00 p.m. – 3:30 p.m.	Networking Break
5:30 p.m. – 9:30 p.m.	Committee Meetings

### Friday, August 7, 2015

Time	Event
7:30 a.m. – 12:00 p.m.	Registration
8:30 a.m. – 12:00 p.m.	Technical Sessions & Workshops
12:00 p.m. – 1:30 p.m.	Closing Luncheon
1:30 p.m. – 5:30 p.m.	Technical Tour (bus departs at noon)

## Plenary Speakers

Plenary Session II - Science and Politics of Watershed Management;  
Watershed Management History and Future 10:30 am – 12:00 PM

### Ven Te Chow Award

Wednesday, August 5th, 2015 8:30 am - 10:00 am

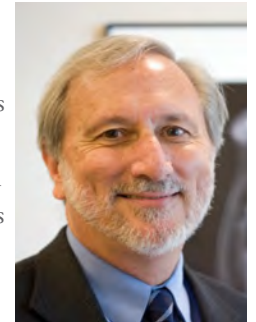
Established in 1995, the Ven Te Chow Award recognizes individuals whose lifetime achievements in the field of hydrologic engineering have been distinguished by exceptional achievement and significant contributions in research, education, or practice.



**The 2015 VEN TE CHOW AWARD is presented to Dr. Richard H. McCuen, Ph.D., M.ASCE**

**Dr. Richard H. McCuen**, The Ben Dyer Professor of Civil and Environmental Engineering, received a B.S.C.E. from Carnegie-Mellon University and a M.S. and Ph.D. from Georgia Institute of Technology. He joined the Civil Engineering faculty at the University of Maryland in 1971. He has served as Director of the Engineering Honors Program since 1986 and served as the Acting Director of the University Honors Program. Dr. McCuen is very active in professional societies, including the American Society of Civil Engineers and the American Water Resources Association. He is currently the Section Editor for surface water hydrology for the ASCE Journal of Hydrologic Engineering. Since 1984 he has served as Book Review Editor of the Journal of the American Water Resources Association and from 1986 to 1990 served as Editor of the Journal of AWRA. He is currently an Associate Editor of the AWRA Water Resources Impact. He has served as an officer or member of many ASCE and AWRA committees.

**Dr. Donald F. Boesch** is a Professor of Marine Science and President of the University of Maryland Center for Environmental Science and University System of Maryland's Vice Chancellor for Environmental Sustainability. He earned his B.S. in biology at Tulane University and Ph.D. in oceanography at the College of William and Mary. Don has conducted ecological and oceanographic research on coastal and continental shelf ecosystems along the Atlantic Coast, and in the Gulf of Mexico, eastern Australia, and the East China Sea. Don has forty years of experience in the application of science in policy formulation for management of large coastal ecosystems and their watersheds, including in the Chesapeake Bay, the Florida Everglades and the Mississippi Delta



**Mr. Noller P. Herbert** is a registered professional engineer who is currently the Director of Conservation Engineering Division (CED) within the Science and Technology Deputy Area, of the Natural Resources Conservation Service (NRCS) in Washington, D.C. In this capacity, he serves as the chief engineer and provides national technical leadership to engineering functions and policy guidance in the agency. CED is comprised of national specialists in key engineering disciplines supporting the NRCS mission area and provides technical leadership, policy development, and coordination of agency engineering technology development and training.

## Plenary Speakers

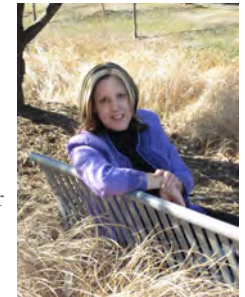
Plenary Session III - Climate Change Impacts on Hydrology; Landscape Design for Watershed Protection 1:30 – 3:00 PM

## Luncheon Speaker

**Dr. Richard “Pete” Hawkins, P.E., F.ASCE, F.EWRI** is Professor Emeritus, University of Arizona, Tucson, AZ. Dr. Hawkins has over 50 years of experience in engineering, hydrology, and natural resources, in education, research, and agency and consulting practice. Recently retired, he taught a variety of courses in general and watershed hydrology, modeling, hydraulics, sediment, water quality, fire science, and statistics. He has published widely in his specialty fields of small watershed hydrology and rainfall-runoff modeling, with accent on land condition impacts. He has taught continuing education courses on Curve Number rainfall-runoff for ASCE and for several local flood control interests. A native of Missouri, he is a graduate of the University of Missouri Columbia, with degrees in both Civil Engineering and in Forestry, and received MS and Ph.D. degrees in Watershed Management from Colorado State University. He has also served on the faculties of Colorado State University, SUNY-Syracuse, and Utah State University. At Arizona he was the Chair of the Watershed Resources program for 10 years. In 2011 was a Visiting Professor with the Warsaw (Poland) University of Life Sciences, and in 2013 at the Università Degli Studi de Palermo (Italy) Dipartimento Scienze Agrarie e Forestali. He has experience with the US Forest Service, USDA-ARS, the California Department of Water Resources, and the California Division of Soil Conservation. In 1986-87 he served as a Distinguished Visiting Scientist with the USEPA in Corvallis OR. He has received several awards for professional service and scholarship, and has had numerous international and consulting assignments. He has been a member of ASCE’s Watershed Management Committee since 1961. In 2003 Dr. Hawkins received ASCE’s Arid Lands Hydraulic Engineering Award



**Ms. Kim Edwards, P.L.A.** attended The George Washington University, where she completed the Landscape Specialist program in 1991. She is a Professional Landscape Architect, Certified Horticulturist, Arborist, Virginia Nutrient Management Planner and a LEED AP. She has been in private practice for 27 years and is the owner of Studio G2 in Virginia Beach, Virginia. Kim’s practice includes working with both public and private clients on a diverse range of projects. She has extensive experience in sustainable site design and asset preservation during construction.



**Dr. Fernando Miralles-Wilhelm** is a hydrologist and water resources engineer with 20 years of experience in modeling of surface and groundwater hydrology, climate-hydrology-vegetation interactions, stormwater management and water quality modeling. Prior to joining the Inter-American Development Bank, he was a member of the faculty at the Massachusetts Institute of Technology, Northeastern University, the University of Miami and Florida International University. He has worked as a consultant in water resources projects in all five continents. He has published over 50 peer reviewed scientific journal articles in topics such as remote sensing of hydrologic cycle processes, climate change impacts on water resources, hydrology and vegetation in ecosystems, and collaborative participation in management of water resources. He holds a mechanical engineering diploma from Universidad Simón Bolívar in Venezuela, a Masters degree in Engineering from the University of California-Irvine, and a Ph.D. in Civil and Environmental Engineering from the Massachusetts Institute of Technology (MIT).



## Workshops

### Plenary Speakers

Dams: Here Today - Gone Tomorrow; Modeling Changes For Watershed Management 3:30 – 5:00 PM

**Mr. Kyle Schilling, P.E. D.WRE, F. EWRI, Dist. M. ASCE**

served as Director of the Corps of Engineers' Institute for Water Resources (IWR) from 1990- 1999, providing leadership for improving the Corps' civil works water efforts during a period of rapidly evolving changes in the US. Under his leadership, IWR produced a steady stream of innovative policies, procedures and methods that rapidly and effectively addressed the changing needs of the Nation in water resources and environmental management. He encouraged staff to seek out opportunities and partnerships with other agencies for joint problem-solving; he advocated collaboration with Corps districts in order to stay current with ongoing needs of field planners.



**Dr. Daniel P. Sheer, Ph.D., P.E.** Dr. Sheer has devoted his professional career to improving water management. After receiving his Ph.D with honors from the Johns Hopkins University in 1974, he became the Planning Engineer, and then the Technical Director of the Interstate Commission on the Potomac River Basin. At ICPRB, he designed the technical work plan for the Washington Metropolitan Area 208 water quality plan, and led the technical effort that produced long term, sustainable water supply for the same region. He was the first Director of CO-OP, the new institution designated to manage the regional supply.

**Curve Number Rainfall-Runoff: Professional Application**

Thursday, August 6 8:30 – Noon

Presented by Richard H. Hawkins, Ph.D., P.E., F.EWRI, F.ASCE & Donald E. Woodward, P.E., F.ASCE

This course covers the history, development and assumptions, technical background, analysis, application, and critique of the Curve Number method of rainfall-runoff. Limitations, strengths, current developments, perspectives and trends are also covered. Comparisons are made to general hydrology, with an eye towards enlightened professional applications. While the presentation is in lecture style, open questions and discussions are encouraged

**Use of River2D for Stream Restoration Design**

Thursday, August 6 1:30 -5:00 pm

Instructors: John S. Schwartz, Ph.D., P.E., and Patrick L. McMahon, Ph.D., P.E.

River2D is a hydrodynamic and habitat model that has multiple uses for stream restoration, including the assessment and design of channel morphology and mesohabitat structure. The hydrodynamic module uses the St. Venant shallow water, depth-averaged equations. The workshop will include a short lecture on fluvial geomorphological and ecohydraulic theories applicable for stream restoration assessment and design. The lecture will address common modeling challenges and how these challenges can be eliminated or overcome. The majority of the time will be learning how to use River2D, a public domain software, and how to use model output for stream restoration design. Attendees please bring a laptop computer with River2D software already loaded.



## Technical Tour

### Engineering Ethics Workshop

**Thursday, August 6 3:30 – 5:00 pm**

Presented by: Steve Starrett, Ph.D., P.E., D.WRE, F.ASCE, F.EWRI and  
Carlos Bertha, Ph.D.

The safety, health and welfare of the public is the engineering profession's #1 fundamental Canon in the Engineers Code of Ethics. We provide technical expertise to projects on behalf of society. The public desires us to provide safe water for drinking, adequate protection from flooding, smart environmental solutions and to plan for generations that follow. Engineers make ethical decisions almost on a daily basis. Its critical to society that engineers uphold high ethical standards. Principle ethical theories will also be explored. Many opportunities to provide input into the conversation, and to hear what engineering peers think of situations will be provided.

### Modeling for Watershed Management and TMDL Development

**Friday, August 7 8:30 – Noon**

Presented by: G. Padmanabhan, Ph.D., P.E., F.ASCE

Watershed hydrologic, hydraulic and water quality models are used in the TMDL development and implementation processes to estimate the pollutant loads entering receiving water bodies and to establish the linkages between the sources of pollution and water quality of the receiving water bodies. The EWRI TMDL Analysis and Modeling Task Committee was established to conduct a comprehensive review of current models used for and suitable for TMDL development and implementation along with the associated issues such as model selection, data collection and compilation, calibration, and uncertainty in the model results.

### Patapsco River Dam Removal Projects

Friday, August 7th - 1:30 – 5:30 PM

(Bus departs at noon from ASCE)

Photo : Bloede Dam, Patapsco River, MD; Courtesy of NOAA



The National Oceanic and Atmospheric Administration (NOAA) and American Rivers, working in partnership with the Maryland Department of Natural Resources (MD DNR) and the Friends of the Patapsco Valley State Park, removed the Union and Simkins dams, located on the Patapsco River near Ellicott City under the American Reinvestment and Recovery Act. Removal of these blockages is part of a larger suite of removals on the Patapsco River aimed at restoring more than 30 miles of free-flowing habitat. The project reconnects and restores eight miles of spawning habitat for American eel, alewife, blueback herring, yellow and white perch, and American shad. The project provides access to nearly 300 square miles of the Patapsco River watershed for American eels.

# Technical Program

## Wednesday, August 5, 2015

Ven Te Chow Award Lecture

Session ID: PS-1

Featured Speaker: Richard McCuen

Time: 8:30 AM - 10:00 AM

Room: CH2M Hill & ASCE [A-B]

Science and Politics of Watershed Management; Watershed Management History and Future

Session ID: PS-2

Featured Speakers: Donald Boesch, Noller Herbert

Time: 10:30 AM - 12:00 PM

Room: CH2M Hill & ASCE [A-B]

Climate Change Impacts on Hydrology; Landscape Design for Watershed Protection

Session ID: PS-3

Featured Speakers: Fernando Miralles-Wilhelm, Kim Edwards

Time: 1:30 PM - 3:00 PM

Room: CH2M Hill & ASCE [A-B]

Dams: Here Today - Gone Tomorrow; Modeling Changes For Watershed Management

Session ID: PS-4

Featured Speakers: Kyle Schilling, Daniel Sheer

Time: 3:30 PM - 5:00 PM

Room: CH2M Hill & ASCE [A-B]

## Thursday, August 6, 2015

### Poster Session

Time: 8:00 AM - 5:00 PM

**Techno-economic Feasibility Study of water Transfer from the Congo- Basin to the Nile Basin**

Heba Essawy, BS.c, Cairo University, Charlottesville, Virginia, United States; Ahmed Foda, MSc, Cairo University Faculty of Engineering, Cairo, Cairo, Egypt

### Generation of Stochastic Rainfall Estimates for the Mekong River Basin

Dumindu Jayasekera, Ph.D, Air Worldwide, San Francisco, California, United States; Chia-Jeng Chen, Ph.D, Air Worldwide, San Francisco, California, United States; Sharika Senarath, Ph.D, Air Worldwide, San Francisco, California, United States; Marc Marcella, Ph.D, Air Worldwide, Boston, Massachusetts, United States

### Public-Private-Student Partnerships: Using Undergraduate Researchers to Diffuse Tensions Among Stakeholders

Stephen Druschel, Ph.D, P.E., Minnesota State, Mankato, Mankato, MN, United States

### Automated Geospatial Watershed Assessment Tool (AGWA)

D. Phillip Guertin, Ph.D., University of Arizona, Tucson, AZ, United States; David Goodrich, Ph.D., Agricultural Research Service, Tucson, Arizona, United States; I. Shea Burns, M.S., Agricultural Research Service, Tucson, Arizona, United States; Yoganand Korgaonkar, M.S., University of Arizona, Tucson, Arizona, United States; Jane Barlow, B.S., University of Arizona, Tucson, Arizona, United States; Brain Sheppard, B.S., University of Arizona, Tucson, Arizona, United States; Carl Unkrich, M.S., Agricultural Research Service, Tucson, Arizona, United States; William Kepner, M.S., U.S. Environmental Protection Agency, Las Vegas, NV, United States

### TMDL and Related Topics

Session ID: TS1-1

Moderator: William Frost

Track: Track I - Watershed Hydrology and Related Topics

Time: 8:30 AM - 10:00 AM

Room: CH2M Hill [A]

### TMDL Modeling Approaches, Model Surveys, and Advances

James Martin, Ph.D., P.E., F. ASCE, D. WRE, Mississippi State University, Starkville, Mississippi, United States; Deva Borah, Ph.D., P.E., Borah Hydro-Environmental Modeling LLC, Chesapeake, VA, United States; Edith Martinez-Guerra, Ph.D. candidate, Mississippi State University, Starkville, Mississippi, United States; Juan Pérez-Gutiérrez, Ph.D. student, Mississippi State University, Starkville, MS,

United States

### An overview of TMDL Obligations/ Requirements and Applications in California

Edward Hosseinipour, Ph.D., P.E., VCWPD, Ventura, CA, United States  
Andrew Parker, M.ASCE, TetraTech, Fairfax, VA, United States

### Is Land Use and Land Cover a Factor in EMC Determination and Selection?

Kenya Goodson, Ph.D., Nspiregreen, LLC, Washington, DC, United States; Chancee Lundy, MS, Nspiregreen, LLC, Washington, DC, United States; Anouk Savineau, P.E., LimnoTech, Washington, DC, United States; Jonathan Champion, BS, District Department of the Environment, Washington, DC, United States

### TMDL Modeling for Compliance Planning at the Maryland State Highway Administration

William Frost, P.E., DWRE, M.ASCE, KCI Technologies, Inc., Sparks, MD, United States; Megan Crunkleton, CE, KCI Technologies, Inc., Sparks, MD, United States

### Comprehensive Watershed Planning for Nutrient Reduction in Durham, North Carolina

Sandi Wilbur, P.E., City of Durham Public Works, Durham, NC, United States; Mike Fowler, P.E., Wildlands Engineering, Inc., Fairfax, VA, United States

### Fisheries Engineering

Session ID: TS2-1

Moderator: Denis Ruttenberg

Track: Track II - Fisheries, Operations and Climatic Trends

Time: 8:30 AM - 10:00 AM

Room: ASCE [B]

### Managing Head-of-Reservoir Conditions at Shasta Lake, California

Katherine Clancey, BS, University of Nevada, Reno, Reno, NV, United States; Laurel Saito, Ph.D., P.E., University of Nevada, Reno, Reno, Nevada, United States; Connie Svoboda, P.E., Bureau of Reclamation, Denver, Colorado, United States; Merlynn Bender, MS, P.E., Bureau of Reclamation, Denver, Colorado, United States; John Hannon, BS, Bureau of

Reclamation, Sacramento, California, United States

### Developing Oxythermal Fish Habitat Models to Identify Cisco Refuge Lakes in Minnesota

Xing Fang, Ph.D., P.E., DWRE, FEWRI, FASCE, Auburn University, Auburn, Alabama, United States; Heinz Stefan, Ph.D., University of Minnesota, Minneapolis, Minnesota, United States; Peter Jacobson, M.S., Minnesota Department of Natural Resources, Park Rapids, Minnesota, United States; Donald Pereira, Ph.D., Minnesota Department of Natural Resources, St. Paul, Minnesota, United States

### Benefits of Stream Simulation Designed Road-Stream Crossings: Flood resiliency, Aquatic Organism Passage and Economics

Brian Austin, P.E., USDA Forest Service, Rutland, VT, United States; Dan McKinley, Biologist, USDA Forest Service, Rutland, VT, United States

### San Jose Creek Watershed Assessment: A study on the Central Coast of California for hydrologic patterns, sediment sources, fish passage, and lagoon morphology

Denis Ruttenberg, P.E., Balance Hydrologics, Inc., Santa Cruz, CA, United States; Barry Hecht, CHG, CEG, Balance Hydrologics, Inc., Berkeley, CA, United States; Danny Hagans, B.S., Pacific Watershed Associates, McKinleyville, CA, United States; Tim Jensen, B.S., Monterey Peninsula Regional Park District, Monterey, CA, United States

### Biological, Chemical and Sedimentation Issues in Watershed Management I

Session ID: TS3-1

Moderator: Donald Frevert

Track: Track III - Watershed Modeling and Related Topics

Time: 8:30 AM - 10:00 AM

Room: Seabury & Smith [C]

### A simulation-optimization framework for least-cost non-point source phosphorus load reduction in the Kalamazoo River watershed, Michigan

Ali Mirchi, Ph.D., Michigan Technological University, Houghton, Michigan, United

States; David Watkins, Ph.D., P.E., Michigan Technological University, Houghton, Michigan, United States

**A New Fish Biological Health Index for Assessing River Health Environment in the Muromi River Japan**

Rita Lopa, DR.Eng., Hasanuddin University Indonesia, Makassar, Sulawesi Selatan, Indonesia; Hiroki Iyooka, DR.Eng., Fukuoka University, Fukuoka, N/A, Japan; Koreyoshi Yamasaki, Professor, Fukuoka University, Fukuoka, N/A, Japan

**Development of planning methods for shorefront vegetation management focusing on submerged plants**

Masatoshi Denda, Ph.D, Public Works Research Institute, Tsukuba-sh, Ibaraki-ken, Japan; Kouji Katagiri, Ph.D, Public Works Research Institute, Tsukuba-shi, Ibaraki-ken, Japan; Mayumi Ooyiri etc, Public Works Research Institute, Tsukuba-shi, Ibaraki-ken, Japan; Yuichi Kayaba, Ph.D, Public Works Research Institute, Tsukuba-sh, Ibaraki-ken, Japan

**Increasing the Value of Watershed Maintenance Activities: Using Community-Scale Gasification to Generate Power from Residual Woody Biomass**

W. David Featherman, P.E., M.ASCE, Sapere Consulting, Inc., Los Gatos, CA, United States

**Workshop: Curve Number Rainfall-Runoff: Professional Application**

**Session ID: WS2-1**

**Moderator: Pete Hawkins , Don Woodward**

**Track: Workshop 2**

**Time: 8:30 AM - 12:00 PM**

**Room: Harris**

**Effects of Modern Forest Practices on Stream**

**Resources - Mica Creek Study - Hydrology and Sediment Changes, Temperature and Nutrient Changes and Biological Changes**

**Session ID: TS1-2**

**Moderator: Terry Cundy**

**Track: Track I - Watershed Hydrology and Related Topics**

**Time: 10:30 AM - 12:00 PM**

**Room: CH2M Hill [A]**

**Panel Discussion on Watershed Management on Private Forest Lands**

Terry Cundy, Ph.D., Potlatch Corporation, Lewiston, ID, United States

**Operations Issues in Watershed Management**

**Session ID: TS2-2**

**Moderator: Ali Mirchi**

**Track: Track II - Fisheries, Operations and Climatic Trends**

**Time: 10:30 AM - 12:00 PM**

**Room: ASCE [B]**

**Use of IRI Ensembles to Characterize ENSO Uncertainty in Water Supply Forecasting for the Lower Colorado River in Texas**

Ronald Anderson, P.E., MBA, D. WRE, Lower Colorado River Authority, Austin, Texas, United States; Bob Rose, , Lower Colorado River Authority, Austin, Texas, United States; Leonard Oliver, , Lower Colorado River Authority, Austin, Texas, United States

**Optimal Management of Watershed under Uncertainty: A Case Study in Diez Lagos Flood Catchment Area, South New Mexico**

Hamed Zamani Sabzi, Ph.D Candidate, New Mexico State University, Las Cruces, New Mexico, United States; James Phillip King, P.E., Ph.D., MBA, New Mexico State University, LAS CRUCES, NM, United States

**Environmentally Driven Operations for the Central Everglades Planning Project**

Alaa Ali, Ph.D, P.E., P.M.P., D.WRE. , South Florida Water Management Distirct, West Palm Beach, FL, United States; Walter Wilcox, P.E., South Florida Water Management Distirct, West Palm Beach, FL, United States

**Biological, Chemical and Sedimentation Issues in Watershed Management II**

**Session ID: TS3-2**

**Moderator: Donald Frevert**

**Track: Track III - Watershed Modeling and Related Topics**

**Time: 10:30 AM - 12:00 PM**

**Room: Seabury & Smith [C]**

**Characteristics of Fine Sediment Transport Along Hillslope Concentrated Flow Pathways Caused by Cattle Traffic**

Zachariah Seiden, E.I., University of Tennessee, Knoxville, Tennessee, United States; John Schwartz, P.E., Ph.D, University of Tennessee, Knoxville, Tennessee, United States; Daniel Yoder, Ph.D, University of Tennessee, Knoxville, Tennessee, United States; Forbes Walker, Ph.D, University of Tennessee, Knoxville, Tennessee, United States

**Temperature effects on cohesive riverbank erosion**

Akin Akinola, MEng, Virginia Polytechnic Institute and State University, Blacksburg, Virginia, United States; Tess Wynn-Thompson, Ph.D, Virginia Polytechnic Institute and State University, Blacksburg, Virginia, United States; Guney Olgun, Ph.D, Virginia Polytechnic Institute and State University, Blacksburg, Virginia, United States

**Watershed Hydrology I**

**Session ID: TS1-3**

**Moderator: Terry Cundy**

**Track: Track I - Watershed Hydrology and Related Topics**

**Time: 1:30 PM - 3:00 PM**

**Room: CH2M Hill [A]**

**A look back at The Watershed Protection and Flood Prevention Act of 1954 (PI-566)**

Donald Woodward, P.E., Retired, Gaithersburg, Maryland, United States

**The Complacent-Violent Response: a Departure from Tradition**

Richard H. Hawkins, Ph.D., P.E., FASCE, FEWRI, University of Arizona, Tucson, AZ, United States; Timothy Ward, Ph.D., P.E., FASCE, FEWRI,, Manhattan College, Riverdale, NY, United States

**Origins of the Standard Asymptotic Curve Number Behavior**

Richard Hawkins, Ph.D., P.E., FEWRI, FASCE, University of Arizona, Tucson, AZ, United States; Timothy Ward, Ph.D., P.E., FASCE, FEWRI,, Manhattan College, Riverdale, NY, United States

**Estimation of the runoff curve number using rainfall-runoff data from agricultural systems in the Eastern Savannas of Colombia**

John Ramirez-Avila, Ph.D, Mississippi State University, Mississippi State, MS, United States; Luis Laurens-Vallejo, BS, Mississippi State University, Mississippi State, MS, United States; Edgar Almansa-Manrique, MS, Colombian Corporation of Agricultural Research - CORPOICA, Villavicencio, Meta, Colombia; Sandra Ortega-Achury, Ph D, Mississippi State University, Mississippi State, MS, United States; Yi Jiang, MS, Mississippi State University, Mississippi State, MS, United States; Richard Hawkins, Ph.D., University of Arizona, Tucson, AZ, United States

**Climatic Trends - I**

**Session ID: TS2-3**

**Moderator: Steve McCutcheon**

**Track: Track II - Fisheries, Operations and Climatic Trends**

**Time: 1:30 PM - 3:00 PM**

**Room: ASCE [B]**

**Drought Analysis Based on Standardized Precipitation Index (SPI) and Streamflow Drought Index (SDI) in Chenar Rahdar River Basin, Southern Iran**

Hassan Akbari, Msc Student , Shiraz University, Yasuj, Kohgeloye va Boyer Ahmad, Iran; GholamReza Rakhshandehroo, Professor, Shiraz University, Shiraz, Fars, Iran; Amirhossein Sharifloo, Msc Student, Shiraz University, Shiraz, Fars, Iran; Ershad Ostadzadeh, S.M.ASCE, Islamic Azad University, Fars Science and Research Branch, ahwaz, khuzestan, Iran

**Comparison of Statistical Downscaling Methods in Projecting Climate Change Impact on Extreme Runoff Events in Chenar Rahdar River Basin (Iran)**

Amir Pourtouserani, Ph.D, Shiraz University, Shiraz, Fars, Iran; GholamReza Rakhshandehroo, Professor, Shiraz University, Shiraz, Fars, Iran; Hassan Akbari, Msc Student, Shiraz University , Yasuj, Kohgeloye va Boyer Ahmad, Iran

**Climate Change and Stormwater Infrastructure in the US Mid-Atlantic Region: A Design Mismatch Coming?**



Glenn Moglen, Ph.D., P.E., FASCE, Virginia Tech, Manassas, VA, United States; Geil Eliana Rios Vidal, EIT, RK&K, Fairfax, Virginia, United States

### **Watershed Modeling I**

**Session ID: TS3-3**

**Moderator: G. Padmanabhan**

**Track: Track III - Watershed Modeling and Related Topics**

**Time: 1:30 PM - 3:00 PM**

**Room: Seabury & Smith [C]**

### **Development of Discharge-Frequency**

**Relationships for Mid- to Low Range Flows**

Molly Moran, Ohio State University, Columbus, OH, United States; Andrew Ward, Ph.D, Ohio State University, Columbus, OH, United States; Jon Witter, Ph.D, Ohio State ATI, Wooster, OH, United States

### **Development and Validation of a Linked HSPF and HEC-RAS Modeling System for the House Creek Watershed**

Zhonglong Zhang, Ph.D., P.E., Environmental Lab., U.S. Army Engineer Research and Development Center, Vicksburg, MS, United States

### **Enhancements to the Water Erosion Prediction Project (WEPP) for Modeling Large Snow-Dominated Mountainous Forest Watersheds**

Anurag Srivastava, Ph.D, University of Idaho, Moscow, Idaho, United States; Joan Wu, P.E., Ph.D, Washington State University, Puyallup, WA, United States; William Elliot, P.E., Ph.D, USDA Forest Service, Moscow, Idaho, United States; Erin Brooks, Ph.D, University of Idaho, Moscow, Idaho, United States

### **Evaluation of Green Infrastructure Designs Using the Automated Geospatial Watershed Assessment Tool**

D. Phillip Guertin, Ph.D., University of Arizona, Tucson, Arizona, United States; Yoganand Korgaonkar, M.S., University of Arizona, Tucson, Arizona, United States; I. Shea Burns, M.S., Agricultural Research Service, Tucson, Arizona, United States; Jane Barlow, B.S., University of Arizona, Tucson, Arizona, United States; Carl Unkrich, M.S., Agricultural Research

Service, Tucson, Arizona, United States; David Goodrich, Ph.D., Agricultural Research Service, Tucson, Arizona, United States; Willam Kepner, M.S., U.S. Environmental Protection Agency, Las Vegas, NV, United States

### **Workshop: Use of River2D for Stream Restoration Design**

**Session ID: WS1-3**

**Moderator: John S. Schwartz , Patrick McMahon**

**Track: Workshop 1**

**Time: 1:30 PM - 5:00 PM**

**Room: DMJM**

### **Watershed Hydrology II**

**Session ID: TS1-4**

**Moderator: Terry Cundy**

**Track: Track I - Watershed Hydrology and Related Topics**

**Time: 3:30 PM - 5:00 PM**

**Room: CH2M Hill [A]**

### **Watershed Management on Private Forest Lands**

Terry Cundy, Ph.D., Potlatch Corporation, Lewiston, ID, United States

### **Current and Future Watershed Management on Private Lands**

Terry Cundy, Ph.D., Potlatch Corporation, Lewiston, ID, United States

### **Use of Fire Spread and Hydrology Models to Target Forest Management on a Municipal Watershed**

William Elliot, P.E., Ph.D., USDA Forest Service, Moscow, ID, United States; Anurag Srivastava, Ph.D., University of Idaho, Moscow, ID, United States; Joan Wu, P.E., Ph.D., Washington State University, Puyallup, WA, United States

### **Evaluating Analytic and Risk Assessment Tools to Estimate Sediment and Nutrients Losses from Agricultural Lands in the Southern Region of the USA**

John Ramirez-Avila, Ph.D, Mississippi State University, Mississippi State, MS, United States; Deanna Osmond, Ph.D., North Carolina State University, Raleigh, NC, United States; Sandra Ortega-Achury, MS, Mississippi State University, Mississippi State, MS, United States;

Adam Forsberg, MS, University of Georgia, Athens, GA, United States; Carl Bolster, Ph D, USDA-ARS, Bowling Green, KY, United States; Daniel Storm, Ph D, Oklahoma State University, Stillwater, OK, United States; Aaron Mittelset, MS, Oklahoma State University, Stillwater, OK, United States; Kelli Alexander, BS, Mississippi State University, Mississippi State, MS, United States; David Radcliffe, Ph.D., University of Georgia, Athens, GA, United States; Larry Oldham, Ph.D., Mississippi State University, Mississippi State, MS, United States; Miguel Cabrera, Ph D, University of Georgia, Athens, GA, United States; Daniel Line, P.E., North Carolina State University, Raleigh, NC, United States; Martin Locke, Ph.D., USDA-ARS, Stoneville, MS, United States; Andrew Sharpley, Ph D, University of Arkansas, Fayetteville, AR, United States

### **Climatic Trends - II**

**Session ID: TS2-4**

**Moderator: Steve McCutcheon**

**Track: Track II - Fisheries, Operations and Climatic Trends**

**Time: 3:30 PM - 5:00 PM**

**Room: ASCE [B]**

### **Climate Change Impact on Probable Maximum Precipitation in Chenar-Rahdar River Basin**

Amirhossein Afrooz, Msc Student, Shiraz University, Shiraz, Fars, Iran; Hassan Akbari, Msc Student, Shiraz University , yasuj, Kohgeloye va Boyer Ahmad, Iran; GholamReza Rakhshandehroo, Professor, Shiraz University, Shiraz, Fars, Iran; Amir Pourtouserkani, Ph.D, Shiraz University, Shiraz, Fars, Iran

### **Climate Change Impact on Intensity-Duration-Frequency Curves in Chenar-Rahdar River Basin**

Hassan Akbari, Msc Student, Shiraz University, yasuj, Kohgeloye va Boyer Ahmad, Iran; GholamReza Rakhshandehroo, Professor, Shiraz University, Shiraz, Fars, Iran; Amirhossein Afrooz, Msc Student, Shiraz University, Shiraz, Fars, Iran; Amir Pourtouserkani, Ph.D, Shiraz University, Shiraz, Fars, Iran

**The Occoquan Watershed: trends from 40 years of observation during a time of changing land use and climate**

Saurav Kumar, Ph.D., Virginia Tech, Manassas, Virginia, United States; Glenn Moglen, Ph.D., Virginia Tech, Manassas, Virginia, United States; Adil Godrej, Ph.D., Virginia Tech, Manassas, Virginia, United States; Thomas Grizzard, Ph.D., Virginia Tech, Manassas, Virginia, United States; Harold Post, Ph.D., Virginia Tech, Manassas, Virginia, United States; Mehdy Barandouzi, M.S., Virginia Tech, Manassas, Virginia, United States

### **Watershed Modeling II**

**Session ID: TS3-4**

**Moderator: Denis Ruttenberg**

**Track: Track III - Watershed Modeling and Related Topics**

**Time: 3:30 PM - 5:00 PM**

**Room: Seabury & Smith [C]**

### **ARCSWAT Modeling Analysis for Post-Wildfire Logging Impacts on Sediment and Water Yields at Salmon-Challis National Forest, Idaho, USA**

Jia Liu, Ph.D, EIT, Michael Baker Cooperation, Manassas, Virginia, United States; Sabu Paul, Ph.D, P.E., Michael Baker Cooperation, Manassas, Virginia, United States; Henry Manguerra, Ph.D, P.E., Michael Baker Cooperation, Alexandria, Virginia, United States

### **Empowering Residents to Improve the Water Quality of their Watersheds using SWAPs: A Case Study**

Katherine Klavon, P.E., Parsons Brinckerhoff, Baltimore, MD, United States; Kelly Lennon, P.E., Parsons Brinckerhoff, Baltimore, MD, United States;

### **Modeling the Potential Impact of Watershed Development on Reservoir Watershed Runoff and Safe Yield Using GIS-Based SWAT Model**

Abdulai Fofanah, P.E., D.WRE, CFM, Louis Berger Consulting Firm, Morristown, NJ, United States

### **Workshop: Engineering Ethics**

**Session ID: WS2-3**

**Moderator: Steve Starrett , Carlos Bertha**

**Track: Workshop 2**

**Time: 3:30 PM - 5:00 PM**

**Room: Harris**



## Friday, August 7, 2015

8:30 am – 10:30 am

Northern Virginia Restoration Bank  
Presentation

Featured Speaker:, Scott R. Petrey, P.E.,  
M.ASCE

Location: Seabury & Smith [C]

### Urban Watershed Hydrology I

**Session ID: TS1-5**

**Moderator: Glenn Moglen**

**Track: Track I - Watershed Hydrology and  
Related Topics**

**Time: 8:30 AM - 10:00 AM**

**Room: CH2M Hill [A]**

### Determining Effective Impervious Area in Ungauged Urban Watersheds

Ali Ebrahimian, Ph.D. Candidate, Saint Anthony  
Falls Laboratory, University of Minnesota,  
Minneapolis, MN, United States; John Gulliver,  
Ph.D., P.E., Saint Anthony Falls Laboratory,  
University of Minnesota, Minneapolis, MN,  
United States; Bruce Wilson, Ph.D., P.E.,  
University of Minnesota, Saint Paul, MN, United  
States

### Clogging Progression Prediction of Permeable Pavement Laboratory Model Using Artificial Neural Networks

Ata Radfar, Ph.D., University of Louisville,  
Louisville, KY, United States; Thomas Rockaway,  
Ph.D., University of Louisville, Louisville,  
Kentucky, United States; Amir Ehsaci, Ph.D.,  
URS Corporation, San Francisco, California,  
United States

### Excess Stream Power Management in Small Urban Stream Systems of the Ridge and Valley Province in Tennessee

Robert Wockman, Ph.D Candidate, University  
of Tennessee, Knoxville, TN, United States; John  
Schwartz, P.E., Ph.D, University of Tennessee,  
Knoxville, TN, United States

### Climatic Trends III

**Session ID: TS2-5**

**Moderator: Claudia C. Hoefft**

**Track: Track II - Fisheries, Operations and  
Climatic Trends**

**Time: 8:30 AM - 10:00 AM**

**Room: ASCE [B]**

### Projected Future Change in Streamflow at some Mountainous Watersheds in Northern California

Jiongfeng Chen, Ph.D, University of California,  
Davis, Davis, CA, United States; Trinh Toan,  
B.S, University of California, Davis, Davis,  
California, United States; Kei Ishida, Ph.D,  
University of California, Davis, Davis, California,  
United States; Suhjung Jang, Ph.D, University  
of California, Davis, Davis, California, United  
States; Noriaki Ohara, Ph.D, Univ. of Wyoming,  
Laramie, Wyoming, United States; Levent  
Kavvas, Ph.D, University of California, Davis,  
Davis, California, United States

### Trend Analysis of Maximum Precipitation over Three Northern California Watersheds Based on 137-Yearlong Dynamical Downscaling

Sercan Ceyhan, Ph.D. Candidate, UC Davis,  
Davis, CA, United States; Levent Kavvas, Prof.,  
UC Davis, Davis, CA, United States; Kei Ishida,  
Ph.D, UC Davis, Davis, CA, United States

### Projected 21st Century climate change on Snow melt over Shasta Dam Watershed

Toan Trinh, Ph.D Candidate, UC Davis, Davis,  
CA, United States; su-Hyung Jang, Ph.D, Korea  
Institute of Water and Environment, Daejeon,  
N/A, Korea, Republic of; Kei Ishida, Ph.D,  
UCDAVIS, Davis, CA, United States; Jiongfeng  
chen, Ph.D, UCDAVIS, Davis, CA, United States;  
Noriaki Ohara, Ph.D, 2. Civil and Architectural  
Engineering, University of Wyoming, Laramie,  
WY 82071, USA, Laramie, WYoming, United  
States; M.Levvent Kavvas, Ph.D, UCDAVIS,  
Davis, CA, United States

### Climate Change Effects on Rain-Snow Phase Transition over Northern California in the 21st Century

KEI ISHIDA, Ph.D, University of California,  
Davis, Davis, California, United States; T. Trinh,  
Ph.D Candidate, University of California, Davis,  
Davis, CA, United States; N. Ohara, Ph.D,  
University of Wyoming, Laramie, Wyoming,  
United States; S. Jang, Ph.D, Korea Water  
Resources Corporation, Daejeon, Daejeon,  
Korea, Republic of; M. L. Kavvas, Ph.D,  
University of California, Davis, Davis, California,

### Workshop: Modeling for Watershed Management and TMDL Development

**Session ID: WS2-5**

**Moderator: G. Padmanabhan**

**Track: Workshop 2**

**Time: 8:30 AM - 12:00 PM**

**Room: Harris**

### Urban Watershed Hydrology II

**Session ID: TS1-6**

**Moderator: Ata Radfar**

**Track: Track I - Watershed Hydrology and  
Related Topics**

**Time: 10:30 AM - 12:00 PM**

**Room: CH2M Hill [A]**

### Restoring Riffle-Pool Structure in an Incised, Straightened Urban Stream Channel Using an Ecohydraulic Modeling Approach

John Schwartz, Ph.D., P.E., University of  
Tennessee, Knoxville, TN, United States; Keil  
Neff, Ph.D., P.E., Tennessee Valley Authority,  
Knoxville, Tennessee, United States; Robert  
Wockman, MS, University of Tennessee,  
Knoxville, Tennessee, United States

### Rainfall interception by street vegetation: can we accurately inform engineering and modeling of green urban watersheds?

Walter Yerker, M.S., Drexel University,  
Philadelphia, PA, United States; Franco  
Montalto, P.E., Ph.D, Drexel University,  
Philadelphia, PA, United States

### Optimization of Pervious Concrete Installation in College Point, Queens

Adrian Ang, B.A.Sc, Columbia University, New  
York, NY, United States; Sri Rangarajan, Ph.D,  
P.E., D.WRE, Boomi Environmental LLC,  
Hillsborough, NJ, United States

### Evolving Issues in Watershed Management

**Session ID: TS2-6**

**Moderator: Don Woodward**

**Track: Track II - Fisheries, Operations and  
Climatic Trends**

**Time: 10:30 AM - 12:00 PM**

**Room: ASCE [B]**

### Decision Tree for Measuring the Interaction of Hyper-Saline Lake and Coastal Aquifer in Lake Urmia

Babak Vaheddoost, Ph.D candidate, Istanbul  
Technical University, Istanbul, Istanbul, Turkey;  
Hafzullah Aksoy, Prof., Istanbul Technical  
University, Istanbul, Istanbul, Turkey; Hiran  
Abghari, Assistant Prof., Urmia University,  
Urmia, West. Azerbaijan, Iran; Saieed Zare  
Naghadeh, Ph.D candidate, Dokuz Eylul  
University, Izmir, Izmir, Turkey

### Empowering the Watershed: A facilitated process and online toolset to promote adaptive co-management and resilience practice for Integrated Water Resources Management (IWRM)

Margaret Herzog, P.E., PMP, Ph.D., Colorado  
State University, Lakewood, CO, United States;  
John Labadie, Ph.D., Colorado State University,  
Fort Collins, CO, United States; Neil Grigg,  
Ph.D., Colorado State University, Fort Collins,  
CO, United States

### An Overview of the Federal Energy Regulatory Commission's Licensing Process for Hydropower Projects

Monir Chowdhury, Ph.D., P.E., Federal Energy  
Regulatory Commission (FERC), Washington,  
District of Columbia, United States



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