HYDROLINK

A Hydrology and Hydraulics Newsletter

November 2008 Issue: 2

AASHTO Technical Committee on Hydrology and Hydraulics

Message from the Technical Committee on Hydrology & Hydraulics Chair

Mike Fazio, UTDOT

We had a great conference last August in Portland, Maine. I enjoyed the presentations and visiting with many of you. The conference covered many topics on water and transportation, providing useful information on recent developments in our industry. I appreciate the organizers' efforts in making the conference a success.

Conferences are forums where we can exchange ideas, share knowledge, and learn from others. This exchange is invaluable for me. I learned many things about many subjects. Just like a market place, where goods are exchanged, at the conference, ideas circulate. Some ideas take a long time to develop, others develop more quickly. Some are tested and some not. We accept or reject ideas according to our biases, knowledge and experience.

Every product has its value but the market sets the price. For instance, a team of scientists said on climate change: "There is much speculation about climatic changes. Available evidence indicates that major changes occur in time scales involving thousands of years. In hydrologic analysis it is conventional to assume flood flows are not affected by climatic trends or cycles." The sentence is from Bulletin #17B. At the time of its publication, 1981, climatologists were predicting global cooling of the earth. Today, they are warning about global warming. Conclusions sometimes change as more evidence is gathered and the analysis of that evidence matures.

In This Issue:

We should be informed on current developments, practices, products and programs. We should be discreet in our choices and evaluate ideas. We should draw conclusions based on rational analysis, and must always be open to new evidence and new interpretations. We must openly exchange ideas and information. That, once again, is the great benefit of conferences like this one. Thanks for your insights.

Technical Committee on Hydrology and Hydraulics at the 2008 National Hydraulics Engineering Conference – Portland, ME

2008 National Hydraulic Engineering Conference a Success

Eric Brown, FHWA

The 2008 National Hydraulic Engineering Conference was held in beautiful, tranquil downtown Portland, Maine, from August 26-29, 2008, to the acclaim of over 210 registered participants and the dismay of many more lobsters. The theme of the conference, "Partnering for Progress in a Changing Environment" was reflected in the range of represented agencies and disciplines, as well as the diversity of topic sessions and presentations. Registered attendees from 46 states and 3 Canadian provinces (British Columbia, Ontario and New Brunswick) participated in the 11 technical presentation sessions and the field trip to the U.S. Army Corps of Engineers Cold Regions Research and Engineering Laboratory (CRREL).

The conference commenced with introductory remarks by Maine Department of Transportation (DOT) Commissioner David A. Cole and Federal Highway Administration (FHWA) Maine Division Administrator Jonathan McDade, followed by keynote speaker Myint Lwin, Director, FHWA Office of Bridge Technology. All three speakers recognized the vital role of the hydraulic engineering discipline in the planning, design, and preservation of surface transportation infrastructure. In addition, the critical need to partner and collaborate to overcome existing and future challenges (specifically, climate change, increasing demand on the Nation's infrastructure, diminishing capital resources, and preservation of the natural environment) was underscored by all. These themes were interwoven throughout the conference sessions which were:

- Innovative Solutions
- Changing Climate's Impact on Transportation
- Asset Management: Doing More with Less
- Water Quality – Partnering for an Improved Environment
- Partnering in Research
- Resolving Issues of the Coastal and Tidal Environment through Partnerships and Collaboration
- Progress in Fish Passage
- Bridge Scour – Progress through Partnerships
- Automating Hydrology

- Advancements in Hydrology
- Progress through Partnerships: Consultants, Universities, Agencies

One of the most heavily attended and discussed sessions was "Progress in Fish Passage". Presentations and discussion focused on various agencies methodologies for designing fish passage culverts, as well as the FHWA's ongoing effort to develop a design approach.

Perhaps the highlight of the conference was a tour of CRREL in nearby Hanover, NH (www.crrel.usace.army.mil). CRREL staff is involved in research areas including climate change, ice jam formation and mitigation, and design of cold weather concrete and pavement subgrade. CRREL staff frequently partner with federal and state agencies to conduct research and develop technology and are willing to discuss opportunities as needs arise.

In addition to the technical sessions and the lab tour, the conference afforded numerous networking opportunities with many of the best and brightest minds in the fields of surface transportation hydrology and hydraulics. The conference hotel also served as a venue for two committee meetings: the American Association of State Highway and Transportation Officials (AASHTO) Technical Committee on Hydrology and Hydraulics and the Transportation Research Board AFB60 Committee on Hydrology, Hydraulics and Water Quality.

The 2008 NHEC steering committee, a collaboration between FHWA, AASHTO, CRREL, and Maine DOT personnel, wishes to thank all of the conference participants, presenters, moderators, tour guides and exhibitors for their contributions to the success of this event.

Members of the conference steering committee especially thank Ms. Jacqueline Guimond of the Maine DOT for her conference planning expertise and many efforts to ensure the success of the conference.

The next biennial conference will be held in 2010. A state DOT host and agency partners are actively being sought. You may stay apprised of the next conference at the FHWA website: http://www.fhwa.dot.gov/engineering/hydraulics/index.cfm. Please consider attending the next conference and even making a presentation.

For questions concerning upcoming 2010 conference or the recently held 2008 conference, including requests for conference presentations,, please contact Cynthia Nurmi at the FHWA resource Center, 404-562-3908 (email: cynthia.nurmi@fhwa.dot.gov).

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Research Update: FHWA and the Argonne National Laboratory Use Supercomputers to Study Hydrodynamic Forces on Flooded Bridge Decks.

Dr. Kornel Kerenyi

Bridges are a vital component of the Nation's transportation network. Evaluating their stability and structural response after flooding is critical to highway safety. When a bridge crossing a waterway is partially or entirely submerged during a flood, the water can exert significant loading on the deck and threaten its integrity. Being able to estimate hydrodynamic loading accurately can help designers and transportation agencies build better, stronger bridges.

Accurately modeling turbulence and sediment transport is essential for estimating the impact of scour on bridges. Researchers typically address problems in

science and engineering through two complementary approaches: experimental and analytical (or theoretical). In many applications, such as the fluid mechanics of streams and the impacts on bridges, the governing equations are nonlinear and, except in special circumstances, analytical solutions are not available. In addition, fluid mechanics applications often are multidimensional in nature and time-dependent, which further complicates attempts to understand and model real-life turbulence and scour conditions.

Researchers at the Federal Highway Administration (FHWA) and the new Transportation Research and Analysis Computing Center (TRACC) in West Chicago, IL, a partnership of the U.S. Department of Transportation (USDOT) and the Argonne National Laboratory, are using supercomputers with multidimensional hydraulics programs to closely mimic real-life conditions (Figure 1). The researchers verify the computers' output using flume models at FHWA's Turner-Fairbank Highway Research Center (TFHRC) Hydraulics Laboratory in McLean, VA, indicating that computers might play a new and valuable role in bridge safety.

Figure1: The TRACC parallel computing system

As computer technology improves and the ability to accurately model turbulence and sediment transport becomes more robust, transportation agencies will benefit in both the planning and design of bridges through improved hydraulic and scour estimation.

Effective use of prototypic experiments is a key approach to understanding real-life phenomena. For many fluid dynamics applications, such as those associated with bridge hydraulics, full-scale tests are not possible. Researchers use smaller scale, and perhaps simplified, representations of the physical configuration, and they extrapolate the results to apply to actual conditions. Some uncertainty remains in this extrapolation, however, related to the use of simplified experiments to predict the behavior of complex physical systems.

Computational fluid dynamics (CFD) attempts to address these issues and complement the experimental and analytical approaches through numerical solutions. CFD is a branch of fluid mechanics that uses numerical methods and algorithms to analyze and solve problems involving fluid flows, such as water. Researchers use computers to perform the millions of calculations necessary to simulate the interaction of fluids with the complex surfaces involved in engineering. CFD enables scientists and engineers to perform numerical simulations in the laboratory and significantly reduce the amount of experimentation and overall cost. CFD is a highly interdisciplinary research area at the interface of physics, applied mathematics, and computer science (Figure 2). For more information contact Dr. Kornel Kerenyi at (202) 493- 3142 or email at kornel.kerenyi@dot.gov

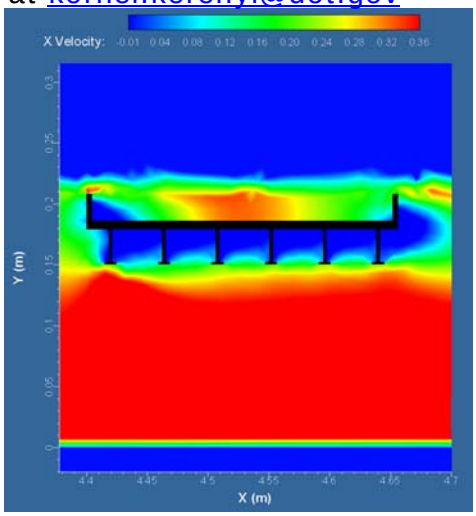


Figure 2: CFD Flow Field Simulation of a submerged bridge deck index

News from the FHWA National Hydraulics Team

Joe Krolak, FHWA

The FHWA National Hydraulics Team (NHT) provides policy, guidance, deployment, research, review, and technical assistance to FHWA Headquarters, FHWA Division Offices, our State DOT partners, and other groups and organizations (including the ATCHH).

The team consists of 17 Hydraulic Engineers located in Washington DC, the Turner Fairbanks Highway Research Center, the four locations of the Resource Center, and within FHWA's Federal Lands Highway Divisions. The NHT leadership consists of Jorge Pagan, Larry Arneson, Kornel Kerenyi, and Bart Bergendahl. Additionally, Jorge Pagan serves as Secretary (ex officio) of the AASHTO Technical Committee on Hydrology and Hydraulics.

Given our relatively small number of folks, the NHT keeps very busy! Over one-half of the NHT members work in the three Federal Lands Highway Divisions (Eastern, Central, Western). For those who aren't familiar, these NHT members operate similarly and face the same challenges as a State DOT drainage unit – performing H&H related analysis and design activities for highway projects within tribal lands, national parks, refuges, and other public lands. That's a lot of area for a small cadre of folks.

Folks are more familiar with other NHT activities, including developing and instructing NHI courses, deploying software, offering technical assistance, and providing program guidance. For this newsletter, we'll focus on some recent NHT activities in software development and deployment – specifically, HY-8, the soon-to-be-released Hydraulics Toolbox, and news on the updated Storm Drain program.

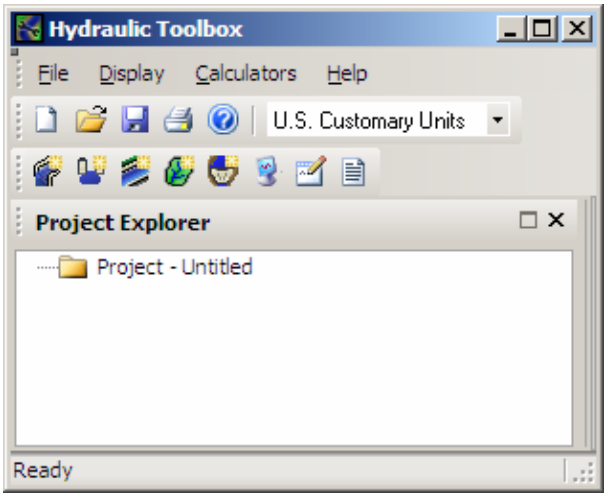
HY-8 version 7.1

In Summer 2008, the NHT released version 7.1 of the HY-8 culvert analyses program. The program incorporated several requested features, including an energy dissipater module, hydraulic analyses of embedded culverts; use of modified outlet loss coefficients; incorporated a dynamic culvert shape database with new materials; and implemented various improvements, technical updates, and bug corrections.

Of course (and after eight months of beta-testing, checking, and other hard work before the release), there are always some remaining bugs. For this reason, FHWA is implementing a maintenance contract to collect and fix these bugs and update the software. The September 30th end-of-federal-fiscal-year complicated the contracts process (and progress), but we hope to have this going before the end of Fall 2008. We appreciate folk's patience on this.

Looking to the next phase of the HY-8 development process, we're looking at potential enhancements such as: hydrograph routing, hydraulic jumps, broken back culverts, horizontal & adverse culverts slopes, and adding additional culvert shapes, materials, and sections.

As always, THE issue is funding these activities. As a result of comments received from some State DOTs, one possibility we're considering would be setting up a pooled fund project. The NHT will keep people posted on this possibility.



Version 7.1 of the HY-8 software is available for download at: http://www.fhwa.dot.gov/engineering/hydraulics/software/hy8/

We strongly suggest reading the "Quick Start" document before any installation.

Finally, if you need to report a HY-8 bug, have any ideas on future HY-8 enhancements, or just want to provide general comments, don't be bashful and send them to CommentsOnHY8@dot.gov !

Hydraulic Toolbox (version 1.0.0)

Coming Soon! The NHT is developing a "Hydraulic Toolbox" program. This handy windows based program will allow a user to perform hydraulic computations such as: channel analyses (including HEC-15 based tractive shear comps), weir analyses, curb and gutter analyses (based on HEC-22), rational method flow tools (including IDF curve generation), detention basin analyses, and various report capabilities.

The Hydraulic Toolbox program may not replace other programs in a State DOT's H&H model collection. However, for those times where you want quick hydraulic analyses, we think that this will be a useful addition to that collection.

Demos of the Hydraulic Toolbox are being presented during the regional hydraulic web conferences (conducted by the FHWA Resource Centers). So if you have the opportunity to "attend" one of these, you'll get the latest and greatest news and information.

The NHT hopes to release the Hydraulic Toolbar program by early 2009. And don't worry – we'll send out an e-mail to let folks know when this product is available!

Storm Drain Software

Good news! After several years of loops and hoops, the NHT hopes to begin development of this (long-awaited) 32-bit non-proprietary software product for the analysis and design of storm drains associated with transportation systems. This software will replace a 16-bit FHWA program called PFP-HYDRA.

This new program will use FHWA approaches and guidance related to hydrology, overland flow, inlets, junctions, and hydraulics during operation, specifically those approaches described in the document "HEC-22 – Urban Drainage Design Manual (2008 revision*)." We also anticipate that the program may partially use approaches and techniques described in the FHWA documents: "HEC-24 – Highway Stormwater Pump Station Design", "HDS-2 – Highway Hydrology", and "HDS-4 – Introduction to Highway Hydraulics."

The additional good news is that we have funding to begin this effort and have developed the specific scope of work! The not-so-good news is that the "paperwork" is still within the procurement/contracts process (that end-of-fiscal-year thing again). With any luck, we'll be getting the development effort started in early 2009.

Summary

The FHWA National Hydraulics Team appreciates the opportunity to share some of our recent activities and plans. We look forward to continuing our relationship with the ATCHH. Should you have any questions or comments on our program, please feel free to e-mail them to joe.krolak@dsot.gov and I'll share them with the NHT members.

*HEC-22 has been updated and is awaiting some final "small touches" before its release.

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Using Flood Hazard Map Areas in GIS

Lisa Sayler, MnDOT

Some new flood hazard data is available to add to ArcMap projects. The Federal Emergency Management Agency (FEMA) has released a new Web Map Service (WMS) for the National Flood Hazard Layer (NFHL) data. This data includes information on flood map availability, panel numbers, and floodways and flood hazard zones. The NFHL data can be added to an ArcMap project as a layer, and the data displayed in conjunction with other data available (aerial photos, proposed project information).

Nationwide only some areas have the newest digital flood hazard information. For those areas with DFIRM (digital flood insurance rate map) data, a great deal of data is available. The figure to the right shows the area near Appleton, MN – the 1% and 0.2% flood boundary areas are shown as well as the cross-section location and base flood elevations.

For other areas older data may be available from the service which shows the boundary of the 1% flood hazard zone. Detailed data for more areas should be coming online in the next couple of years as part of FEMA's map modernization efforts.

Resources for the NFHL, WMS, and other FEMA mapping products

- The data symbology is set up so that as you zoom into or out from the map, different data will be displayed. The symbology key is available at: https://hazards.fema.gov/femaportal/resources/symbology.htm
- A helpsheet with more details on NFHL WMS is available from FEMA at: http://www.fema.gov/library/viewRecord.do?id=3292
- NFHL data can also be viewed with an on-line mapping service at: https://hazards.fema.gov/wps/portal/mapviewer
- NFHL data can be added to Google Earth, the helpsheet is at: http://www.fema.gov/library/viewRecord.do?id=3289

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Update On NCHRP 15-36 Project

Te Ngo, OKDOT

The current standard of practice for joint probability analysis (sometimes called coincident frequency analysis) at the confluence of two waterways is based on Table 1 below.

AREA RATIO	FREQUENCIES FOR COINCIDENTAL OCCURRENCE			
	10-Year Design		100-Year Design	
	Mainstream	Tributary	Mainstream	Tributary
10,000 to 1	1	10	2	100
	10	1	100	2
1,000 to 1	2	10	10	100
	10	2	100	10
100 to 1	5	10	25	100
	10	5	100	25
10 to 1	10	10	50	100
	10	10	100	50
1 to 1	10	10	100	100
	10	10	100	100

This Table was developed by the Norfolk District of the United States Army Corps of Engineers (USACE) during the 1970's.

Because this Table was based on a single site specific study, it may not be appropriate to use for the whole country. Therefore, in 2005, the AASHTO Technical Committee on Hydrology and Hydraulics , with the support of the Transportation Research Board Technical Committee AFB60 (TRB-AFB60) has submitted a problem statement entitle " **Estimating Joint Probabilities of Design Coincident Flows at Stream Confluences"** to the AASHTO Standing Committee on Research (SCOR) for funding.

SCOR approved the project and funded it through the National Cooperative Highway Research Program (NCHRP) project No 15-36, with a total cost of $400,000 for a duration of 36 months. The first meeting of the panel members of project NCHRP 15-36 was in Washington DC on August 15-16, 2005 to prepare the goal and objective of the project in details to advertise for bidding. The second meeting of the panel members of project NCHRP 15-36 was at Washington DC in November 27 & 28, 2005. During this meeting, the panel members choose Kilgore Consulting and Management as the winning contractor of the project.

Kilgore Consulting and Management started working on the project on May, 2006. The final

report of the project is supposed to be submitted by Kilgore Consulting and Management on April 27, 2009. The final meeting between panel members and the staff of Kilgore Consulting and Management has occurred on September 16&17, 2008 at the main office of the National Academy of Sciences in Washington DC. At the conclusion of that meeting, Mr. Roger T. Kilgore, president of Kilgore Consulting and Management Company, stated that with the exception of unpredicted problems, the project should be finished on time.

Sitting : Joe Krolak (FHWA), David Reynaud(NCHRP),Brad Moore (KCM),George Long (NYDOT).
Standing : Kornel Kerenyi (FHWA),Kevin Flora(CADOT),Will Thomas(Michael Baker jr., Inc.),George "Rudy" Herrmann(TXDOT),Te Ngo(OKDOT), Brooks Booher (Arkansas SHTD), Michael Wawszkiewicz(OHDOT), David Thompson (KCM), Roger Kilgore (KCM) and Rocky Durrans (University of Alabama)

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Updates to Watershed Modeling System (WMS) Released

Larry Arneson, FHWA

Watershed Modeling System (WMS) – Aquaveo, LLC in collaboration with FHWA has released version 8.1 of WMS. This version includes many new features including access to a new password generator that automatically issues a one month password. Unlike previous versions, the new password generator allows the software to be enabled for use the same day the password request is made. A one year password will be issued by FHWA to all State Department of Transportation employees within one month of the initial password request.

WMS version 8.1 model enhancements and new features include:

- Delineate a watershed and export the watershed boundaries and computed watershed data to XPSWMM or to the EPA Storm Water Management Model (SWMM).

- Use NEXRAD RADAR rainfall data, including archived rainfall data from the National Weather Service. NEXRAD rainfall grids can be read and the Thiessen polygon-based gage weights for each sub-basin and the total precipitation for each gage computed based on the rainfall grids.

- Convert radar-derived precipitation grids directly to formats that can be used in the quasi-distributed HMS MODClark model. The MODClark model in WMS can be defined at any resolution and a curve number, rainfall value, and travel time at each cell on the grid can be computed. The model can be exported to HMS where the MODClark method can be utilized. The powerful MODClark modeling capabilities in WMS are not available in any other software product.

- A new HY-8 culvert coverage to define the location of your culvert and edit the data associated with the culvert. The HY-8 culvert coverage can be linked with the detention basin calculator to route a hydrograph through a culvert and determine the amount of peak flow attenuation. Report generation, energy dissipation structure analysis capabilities, and many other powerful features are available.

- WMS 8.1 now provides full support for all the modeling capabilities available in HEC-RAS 4.0.

- Expanded "Get Data" toolbar includes two new buttons: The "Get Data From Map" button to download NED (DEM), Land Use, or Microsoft TerraServer aerial imagery and topographic data and the "Hydrologic Modeling Wizard" button that automatically delineates the watershed.

- Windows Vista graphics support has been added dramatically increasing WMS graphics display speed.

States Department of Transportation employees can obtain Version 8.1 of WMS at http://www.ems-i.com. For technical questions related to hydrologic and hydraulic modeling projects or information on available training for WMS, contact Larry Arneson at the FHWA Resource Center, 720-963-3200 (email: larry.arneson@fhwa.dot.gov).

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HIGHLIGHTS: Concerns of the States

Issue: Should we consider potential impacts of climate change when designing hydraulic infrastructure? How is your state or agency reacting to the "climate change" issue?

Responses:

I am not sure if the rainfall we are experiencing is due to global warming effects. Our main concern is the usual "sediment transport" problem (besides highway funds). We have many complaints from the property owners located downstream of our structures that they are inundated with sediments generated from the sandy upstream drainage basins. Each situation is different; some have steep slope channels, then there are wide channels, and others have meandering channels. Our right of way is very limited to provide siltation basins, and the grade control option is impractical.

I think we should consider the "Effects of Climate Change on Hydraulic Structure Design Criteria," although, the sediment transport issue can be resolved by simply adding a bulking factor to upsize the structures (if this can be considered effects of climate change when we experience heavier rainfall!). However, what do we do when it is a big problem downstream in Arid Region like the Southwest? That is the big issue.
New Mexico DOT

Here at Caltrans, the directive has been given that the Department is to have a "plan" by the end of calendar 2008.....though at present it's likely that the "plan" will simply be an outline of what steps need to be taken in order to determine what we actually will revise or adopt at some point in the future.

What does seem likely is that the timeframe for adopting some specifics related to sea level rise are not far off. The value of 55" of rise by year 2100 is being used more frequently and with more "confidence", but typically by individuals without the background to say what the baseline is, or why that amount. The relative effect on hydraulic structures will be very site specific - we have some locations on the northern coast where tectonic uplift has resulted in no net rise in ocean levels compared to land - while other areas in our inland delta are experiencing subsidence and an even greater differential in sea level to land level change with respect to time.

It appears that assessments of possible hydrologic changes are going to take much longer, partially due to the basic uncertainty associated with current statistical analysis and data limitations, and partially due to the significant variability and uncertainty in model projections. That uncertainty creates some interesting scenarios. It's fairly well accepted that climate change is affecting both snowfall and snow accumulation. In the northern part of the state, many of the major rivers and streams floods of record were a result of warmer storms creating significant snowmelt. An assumption of reduced snowpack and uncertain changes to precipitation may lead to assumptions of lower flooding risk - even though many projections assume greater flooding due to warmer air mass and the potential of holding more moisture. The only thing that appears certain is the level of uncertainty.

So - it seems that we will be looking to adopt some amount of sea level rise projection, and that will impact a variety of drainage structures, from bridges and culverts to tide gates and shore protection to how and where we design coastal wetlands. Change is coming and some of it is coming soon.
California DOT

We are taking a wait and see approach.
South Carolina DOT

Here is a link to a recent newsletter put out by FHWA on Climate Change:
http://www.fhwa.dot.gov/hep/climatechange/newsletter/index.htm
FHWA

Global Warming Effects of Highway Bridge/Culvert/Storm Drain.

The global warming frenzy\hysteria has now reached the highway drainage designers. The current methods of estimating design hydrology all have large standard errors. If the global warming factor (GWF) ranges between 0.8 and 1.2 that is rather insignificant. Given the large standard errors.

If the GWF is >1.1 then that begins to significantly add to the design cost of structure. Economic Risk Analysis was experimented with in the late 1970's. It generally showed that the optimum design frequency could be less than the arbitrary standards currently used.

If takes 30 years for the effects of global warming to significantly affect the hydrology, at what point in time should the GWF be applied Q = Q*(GWF)*(Year-2008)^k1.

If the politicians solve the global warming “problem” what temperature will they agree upon? Will they reverse the temperature to the year 2000, 1929, 1776, April 12, 1861, 1492, 1066?

That calls for another factor, the political correction factor PCF.

Q = Q*(GWF)*(Year-2008)^k1* PCF

High tailwater conditions. In Wyoming the sea level rise due to global warming will not affect our tailwater depth computations.
Wyoming DOT

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AASHTO Update – Funding Issues and Reauthorization

Kelley Rehm P.E.

At the AASHTO Annual meeting in Hartford, Connecticut on Monday, the American Association of State Highway and Transportation Officials approved a slate of recommendations for next year's authorization of federal highway and transit programs. The current legislation expires September 30, 2009.

The comprehensive multi-modal package of recommendations urges that the federal program go "back to basics" by focusing on areas of national interest – preservation and renewal, interstate commerce, safety, congestion, system reliability, and enhanced environment and quality of life. Increased federal funding would be coupled with national performance standards established to achieve the national goals. States would self-define targets that would deliver accountability for the investment of federal funds.

Among the goals called for in AASHTO's new transportation agenda are:

- Increasing funding for congestion relief projects and metro areas;
- Improving highway connections and transit access for rural America;
- Doubling transit ridership to 20 billion by 2030, and 50 billion by 2050;
- Trimming 6-12 months from project delivery time by expanding state environmental responsibilities and integrating planning;
- Dedicating federal funding for a fast and reliable intercity passenger rail network;
- Reducing highway traffic fatalities by half in two decades; and
- Moving as swiftly as practical from current funding methods to a distance-based user fee.

Reform proposals

The AASHTO recommendations call for:

- Streamlining of the current number of federal programs and concentrating 90 percent of federal dollars on "core programs" distributed to the states;
- Capping earmarks at no more than five percent of the federal program;
- Expanding the current congestion air quality program to include climate change initiatives;
- Creating a new "operations" program to fund low-cost, rapid deployment projects to reduce delay and improve reliability of the system;

- Providing dedicated federal funding for a national intercity passenger rail system including high speed rail corridors, regional corridors, and long distance service;
- Addressing expanding freight transportation needs though planning and investment programs; and
- Boosting transit funding and ridership while streamlining the federal program structure and grant processes.

$545 Billion Six-Year Multi-modal Program Needed

Emphasizing the need to employ every kind of transportation to meet future demands, AASHTO calls for an overall $545 billion investment from 2010 through 2015 for highways, transit, freight movement, and intercity passenger rail. Included are the following:

- $375 billion for highways,
- $93 billion for transit,
- $42 billion for freight improvements (from sources outside the Highway Trust Fund), and
- $35 billion dedicated funding for intercity passenger rail.

The proposal identifies a number of possible funding options for consideration by Congress and calls for maximum flexibility for state and local governments in the way the funds are used.

The policy positions approved by the AASHTO Board of Directors are available online at http://www.transportation.org/?siteid=98.Any questions can be directed to Kelley Rehm, the AASHTO Staff Liaison, at krehm@aashto.org

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Winner of Name the Newsletter Contest Announced

The winner of our name the newsletter contest is Dr. Junke (Drinker) Guo, who is Assistant Professor of Hydraulics and Fluid Mechanics in the Department of Civil Engineering at University of Nebraska - Lincoln. His submittal "Hydrolink" emphasizes the connection between AASHTO and it's members. Congratulations Dr. Guo for coming up with a really great title.

Thanks to all those who submitted names for consideration. Your input and participation are appreciated by the editorial staff.

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Membership News

Welcome to new AASHTO Technical Committee on Hydrology and Hydraulics (TCHH) members who joined in 2008, Doug Morse (New York State DOT) and Stephen Sisson (Delaware DOT).

We bid a sad farewell to Rae Van Hoven (New Mexico DOT) who is retiring December 2008 and is resigning from the AASHTO TCHH. Thanks to Rae for all her work in the past years with TCHH! She will be missed!

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Calendar of Events

AASHTO TCHH Fall Meeting
May 5 – 8, 2009
Indianapolis, IN
Embassy Suites Downtown

(Invitation only)

Transportation Research Board
January 11-15, 2009
Wardham Marriott – Washington, DC
http://www.trb.org/meeting/2009/default.asp

International Conference on Water Scarcity, Global Changes and Groundwater Management Responses
Dec. 1-6, 2008
Irvine, CA
http://www.uwrc.uci.edu/documents/SCARCE-WATER-BROCHURE-Final.pdf

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Groundwater Monitoring: Design, Analysis, Communication, and Integration with Decision Making
Feb 25-26, 2009
Anaheim, CA
http://grac.org/monitoring.asp

World Environmental & Water Resources Congress 2009
May 17-21, 2009
Kansas City, MO
http://content.asce.org/conferences/ewri2009/index.html

The 4th IASME / WSEAS International Conference on WATER RESOURCES, HYDRAULICS & HYDROLOGY
University of Cambridge, UK
Feb. 24-26, 2009
http://www.wseas.us/conferences/2009/cambridge/whh/index.html

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THE VOICE OF TRANSPORTATION

This newsletter is published biannually by the AASHTO Technical Committee on Hydrology and Hydraulics. Please send suggestions for articles and comments to: *Andrea.Hendrickson@dot.state.mn.us****, or call 651-366-4466.***

To be added to the mailing list please send your email to Kelley Rehm at: krehm@aashto.org

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