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PRACTICE

My practical experience is varied and substantial. My focus is on the application of hydrologic and hydraulic models to the solution of engineering problems. The models include numerical models, such as the U.S. Army Corps of Engineering's (USACE) HEC-HMS (generalized rainfall-runoff model), HEC-RAS (Hydraulic River Analysis System), and statistical modeling tools such as USACE's HEC-SSP (Statistical Software Package), U.S. Geological Survey's PeakFQ (flood frequency analysis software), and custom scripts developed using the open source R-Project software. I have substantial experience with the hydrologic and hydraulic components of dam safety studies, having worked on more than 30 such studies, mostly in Missouri. I execute hydraulic modeling studies to address the impact of proposed projects on the floodplain boundaries of FEMA-regulated floodplains. I serve as an expert witness involving both surface- and ground-water litigation, for both plaintiffs and defendants.

RESEARCH

My research interest is the modeling of surface-water and ground-water hydrologic processes. In particular, I am interested in studying problems associated with transport of water and water-borne constituents through the land-based part of the hydrologic cycle. The principal means of investigation are numerical models coupled with physical models and measurements of field processes. For some situations application of statistical analyses and stochastic models is required.

Recent research comprises projects for the Texas Department of Transportation (TxDOT), National Cooperative Highway Research Program (NCHRP), and Texas Water Development Board (TWDB). A set of important basic hydrologic studies are underway with cooperation from researchers working for U.S. Geological Survey (USGS), Texas District, Auburn University, and Texas Tech University (TTU). A review of applicable hydrologic technology for application by TxDOT analysts has been ongoing for nearly a decade. In addition, methods for estimating the joint probability of concurrent flooding at stream confluences is a topic of interest for NCHRP. Finally, a project for TWDB recently began to examine the suite of generally available general (GCM) circulation models to determine which model or models is appropriate for estimating climate change for Texas and to determine appropriate mechanics for downscaling GCM results to the regional scale.

EXPERIENCE

Consulting Hydrologist, self-employed, 1980–present. As a consulting hydrologist, I undertake a wide variety of assignments. I am sometimes called to serve as an expert in legal cases. One complicated case was the source of groundwater that was damaging house foundations in Laredo, Texas. For another project, I analyzed the effect of different pumping strategies for a well field on an alluvial aquifer. Another challenging assignment was to determine the floodplain hydraulics for a braided stream associated with flooding of the complainants' property. In other projects, I routinely use hydrologic and hydraulic models to produce analysis supporting mining permits, including surface- and ground-water baseline and impact analyses,

spillway capacity and design (Missouri Dam Safety program, dams in Missouri, Nevada, and Texas), including dam-breach and downstream inundation analyses, and provide modeling and engineering support for a variety of other projects. I often provide support services for other consultants who do not have an expert hydrologist on staff.

Director of Engineering, R.O. Anderson Engineering, 2007–2015. As one of five directors of engineering, my responsibilities included development of research- and practice-oriented projects, interaction with clients and research sponsors, and execution of civil engineering projects, especially those dealing with hydrology and hydraulics.

Adjunct Professor, Texas Tech University, Lubbock, Texas, 2007–2012. Responsible for oversight of graduate students and research projects. Although I am no longer a tenured faculty member, I continue to work with research faculty and I am still a member of the graduate faculty at Texas Tech University.

Associate Professor, Texas Tech University, Lubbock, Texas, 1993–2006. During my tenure at Texas Tech University, I was responsible for developing and teaching courses to undergraduate and graduate students treating hydrologic and hydraulic analysis and design. I was also responsible for developing and executing and externally-funded research program, which I did successfully, executing work exceeding $5M over the course of 14 years of academic life. I advised hundreds of undergraduate students and oversaw the research work and thesis preparation of 29 graduate students, of which two were for the Ph.D.

Hydrologist, U.S. Geological Survey, Water Resources Division, Office of Surface Water, Stennis Space Center, Mississippi, 1989–1993 (Series 1315, GS-12). When I finished my tenure with the U.S. Federal Government, I was chief of the *Deterministic Models Project* with an annual budget of $300,000. My prime responsibility was the technical support and training of Division personnel in use of hydrologic and hydraulic models. Additional responsibilities included developing numerical models of hydrologic and hydraulic processes, conducting research in support of deterministic modeling, executing project reviews, completing district surface-water reviews, and instructing theory and practice of hydrologic and hydraulic modeling.

Civil Engineer/Staff Hydrologist, Law Engineering Testing Company, Englewood, Colorado, 1982–1983. While working for Law Engineering, I was responsible for technical execution of a variety of hydraulics and hydrology projects, including analysis of flood plain hydraulics, design of a construction dewatering wellpoint field, and forensic review of an off-stream earth dam with a serious underseepage problem.

EDUCATION

Ph.D. in Civil Engineering (Hydraulics and Hydrology, Mathematics minor), University of Missouri–Rolla[1], May 1989. Dissertation title: *Determining Parameters for a Continuous Simulation Model by Estimation, Calibration Using Measured Data, or Calibration Using Regional Regression Equations.* Chancellor's Fellow.

Master of Science in Civil Engineering (Hydraulics and Hydrology), University of Missouri–Rolla[1], May 1983. Thesis title: *A Method for Simulating Hydrologic Budgets Using Meteorological Data and the SCS*

[1]The University of Missouri–Rolla is now the Missouri University of Science and Technology.

Curve Number Procedure. Chancellor's Fellow.

Bachelor of Science in Civil Engineering University of Missouri–Rolla[1], December 1980. Honors Scholar in Engineering. Honors report title: *A Finite Element Ground-Water Model*, Magna Cum Laude, Tau Beta Pi, Chi Epsilon, Kappa Mu Epsilon, Phi Kappa Phi, Order of the Engineer.

PROFESSIONAL ORGANIZATIONS AND REGISTRATION

Registered Professional Engineer: Missouri (1989), Texas (2006), and Nevada (2008).

Certified Floodplain Manager (2007–2017).

Professional Hydrologist, Surface Water (2012).

Diplomate, Water Resources Engineering (2008–2017).

Past Member, American Geophysical Union.

Past Member, American Society of Civil Engineers (Chair, Texas section hydraulics technical committee, 1995–2002; chair, Mississippi section technical committee on computers in civil engineering, 1991–1992; branch secretary, Mississippi section 1990).

Friend of the Committee, Past Member, Transportation Research Board Advisory Committee AFB60 on research in hydraulics, hydrology, and environmental concerns (1996–2005, 2012–present; was Committee A2A03).

RESEARCH PROJECTS

Since 1993, Dr. Thompson directed research projects with budgets totaling about $4.65M. In addition to the projects Dr. Thompson directed, he participated in other research projects with a total funding exceeding $2M.

Revision of Hydraulic Design Standards 2 and HEC-19, FHWA (2020–2023), budget $100K. Member of the project team to update the HDS2 standards, create a new version of HEC-19 (developing hydrologic/hydraulic methods), and a suite of training courses for the National Hydraulics Institute. Worked as a subcontractor to Kilgore Consulting and Management with Roger Kilgore, P.E., as lead consultant.

Applying Climate Change Information to Hydrologic and Hydraulic Design of Transportation Infrastructure, NCHRP 15-61, budget $80K. I was tasked with developing the background and opportunities assessment portion to determine what hydrologic technology is available or could be developed for use in assessing the potential impacts of climate change on design of transportation infrastructure.

Guidelines for Highways in the Riverine Environment, HEC-17, budget $50K, funded by Federal Highways Administration in response to Executive Order 13690 that directed Federal agencies to use the best actionable data regarding climate change in their activities. Worked as subcontractor to Kilgore Consulting and Management with Roger Kilgore, P.E., as lead consultant.

Assessment of global climate models for water resources planning applications, budget $90K, funded by Texas

Water Development Board. Project objective is to determine the general circulation model or models most appropriate for assessing climate change in Texas and to examine mechanics for downscaling results from the selected model or models. Co-PI with Ken Rainwater (Texas Tech) and Spandana Tummuri (CDMSmith).

Evaluation of hydrologic techniques for areas with low topographic slope, budget $300K, funded by Texas Department of Transportation. Project objective is to evaluate current hydrologic technology for estimating watershed response time for watersheds with low topographic slope. If (as expected) those methods produce poor estimates, then develop technology appropriate for providing reasonable estimates to be used to develop design discharges for drainage and other hydraulic design activities. Co-PI with Ted Cleveland (research supervisor, TTU), William Asquith (USGS), and Ming-Han Li (Texas A&M).

Subdivision of watersheds for modeling, budget $325K, funded by Texas Department of Transportation. Intent of the project is to develop a protocol for appropriate subdivision of watersheds into sub-watersheds. Research supervisor with co-PI's William Asquith (USGS) and Ted Cleveland (UH).

Develop statewide regression equations for improved flood peak estimation, budget $326K, funded by Texas Department of Transportation. Intent of the project is to extend work done on TxDOT Project 0–4405 with regional regression equations using updated methods for flood frequency estimation and regression analysis. Research supervisor with co-PI's with William Asquith (USGS) and Lucia Barbato.

Transport spill containment for Texas highways, budget $290K, funded by Texas Department of Transportation. Intent of the project is to review and/or develop structures for mitigating hazardous materials spills along highways in sensitive areas. Applied results of other TxDOT research projects to develop mechanics for analyzing capacity of detention ponds to dual-serve as hazardous materials traps. Research supervisor with co-PI Audra Morse.

Estimating joint probabilities of design coincident flows at stream confluences, budget $350K, funded by National Cooperative Highway Research Program, Washington D.C. Purpose of research is to develop a method for estimating design discharges at locations where there are confluent flows. Co-PI with David Ford and Roger Kilgore as lead.

Timing parameter for unitgraphs, budget $119K, funded by Texas Dept. of Transportation. Study to examine current procedures for estimating time of concentration (travel time) and compare with other measures to develop a timing parameter for unit hydrograph deployment. Co-PI with Xing Fang (Lamar).

Design guidance for stream crossings in areas of extreme bed-load mobility, budget $860K, funded by Texas Dept. of Transportation. Study to examine procedures for mitigation of deposition of large bed materials (cobbles and boulders) on, and damage to, low-water crossings in the hill country of Texas. Research supervisor with Co-PI's Will Asquith (USGS), Ted Cleveland and K.H. Wang (UH), and Xing Fang (Lamar).

Hydrologic scale and design procedures budget $140K, funded by Texas Dept. of Transportation. Study to examine the relation between scale, as represented by drainage area, and design methodology. Research supervisor with Co-PI's Tony Cahill and Ming-Han Li (TAMU), and Will Asquith (USGS).

Review of drainage design methods, budget $36K, funded by Texas Dept. of Transportation. Study to examine discrepancy between inlet design procedure and drainage network design procedure. Co-PI with

Xing Fang (Lamar).

Unit Hydrographs for Texas, budget $1.04M, funded by Texas Dept. of Transportation. Study to complete literature review of methods for developing and regionalizing unit hydrographs, then compile a data base of streamflow and precipitation measurements and develop a synthetic unit hydrograph for TxDOT design applications. Research supervisor with co-PI's Will Asquith (USGS), Xing Fang (Lamar), and Ted Cleveland (University of Houston).

Design Hyetographs for Texas, budget $648K, funded by Texas Dept. of Transportation. Study to complete literature review of design hyetographs for development of drainage designs, then apply methods to develop hyetographs specifically for Texas meteorology. TxDOT will use the resulting design procedures for development of highway drainage designs. Research supervisory with co-PI's Will Asquith (USGS), Xing Fang (Lamar), and Ted Cleveland (University of Houston).

Interactions Between Precipitation, Evapotranspiration, Streamflow, and Groundwater, budget $35K, funded by Texas Water Development Board through the Llano Estacado Regional Water Planning Group. Study to examine statistical correlation and trends between hydrologic variables. Co-directed with Lloyd Urban and Ken Rainwater, Texas Tech University Water Resources Center.

Role of Playa Lakes in the South High Plains Hydrology, budget $12K, funded by Texas Water Development Board through the Llano Estacado Regional Water Planning Group. Study to synthesize current knowledge of playa lake recharge for the South High Plains region of Texas. Co-directed with Lloyd Urban and Ken Rainwater, Texas Tech University Water Resources Center.

Climatic Adjustment of NRCS Curve Numbers, budget $370K, funded by Texas Department of Transportation. Study to compute runoff curve numbers from selected watersheds geographically distributed across the state, then examine relations between curve number, aridity, and geographic location. Co-directed with Will Asquith, U.S. Geological Survey.

Updated Topographic Surveys of the Pantex Plant,, budget $58K, funded by Department of Energy through Mason & Hanger Corporation. Study to provide GPS surveys of plant facilities for development of new topographic maps. Ultimately, the mapping will be used to develop hydrologic models for stormwater management. Co-directed with Ken Rainwater.

Effects of Combined Absorbic and Evaporative Disposal Methods on Drainfield Sizing in Arid and Semiarid Areas, budget $294K, funded by Texas Natural Resource Conservation Commission. Study to evaluate design parameters for septic tank systems installed in arid and semiarid regions of the state. Co-directed with Heyward Ramsey, Ken Rainwater, Tony Mollhagen, and Richard Zartman.

Effectiveness of Low-Cost Stormwater Control Measures, budget $26K, funded by Texas Department of Transportation. Study to evaluate effectiveness of low-cost stormwater best management practices as applied to highway environments. Co-directed with Harlow Landphair, Texas Transportation Institute, Texas A&M University.

Interactions Between Precipitation, Evapotranspiration, Streamflow, and Ground Water, budget $25K, funded by Water Resources Center, Texas Tech University and Texas Water Development Board. Study to determine a hydrologic budget for several watersheds along the South High Plains region of Texas and examine

for correlation between precipitation, streamflow, and ground water. Co-directed with Ken Rainwater and Lloyd Urban.

Large Scale Injection of Carbon Dioxide for Removal of Carbonate Scale, budget $10K, funded by Canadian River Municipal Water Authority. Studied effects of injecting carbon dioxide into central system pipeline for removal of carbonate scale (see central system pipeline project below). Co-directed with Ken Rainwater.

Design Guidelines for Channel Modifications, budget $210K, funded by Texas Department of Transportation. Project called for research and development of design guidelines for stream crossings that incorporate good hydraulic design practices, concern for environmental factors, and fit the aesthetics of the locale. Co-directed with Tony Mollhagen, Heyward Ramsey (Civil Engineering), and Tom Lehman (Geosciences).

Field Study to Determine Feasibility of Using Carbon Dioxide as a Scale Removal Technology, budget $10K, funded by Canadian River Municipal Water Authority. Project involved assisting Canadian River Municipal Water Authority in testing the efficacy of carbon dioxide injection into the central system pipeline for reducing the pH of the flow such that the water is not saturated with respect to calcium carbonate. Co-directed with Ken Rainwater.

Use of GCM Predictions of Climate Change to Assess Impacts on Water Resources Systems, budget $270K, funded by National Institute for Global Environmental Change. Project objective was to develop methodology to apply GCM outputs to assess potential impact of climate change on river basin hydrology through the flow-duration curve. Required development of river basin model, calibration of model to actual watershed data, development of climate models from regional meteorology, transfer of GCM predictions of changes in mean and variance of climate variables to climate models, and use of resulting climate models to drive the calibrated hydrologic model. Co-directed with Richard Peterson, atmospheric sciences.

Water Budgets of Playa Lakes, budget $41K, funded by Texas Tech University Water Resources Center. Project was designed to establish and use a database of stage-volume relations and continuous recordings of playa stage to estimate volume of evaporation and infiltration through playa bed sediments.

Mensuration of Playa Lake Bathymetry, budget $11K, funded by the City of Lubbock, Texas. Project required field surveys of playa lake bathymetry, surface surveys for vertical and horizontal control, and generation of bathymetric (topographic) maps. Co-directed with Tony Mollhagen.

Erosion Control Measures Along Interstate 20 Near Tyler, Texas, budget $67K, funded by Texas Department of Transportation. Project required selection, recommendation, and testing of erosion control measures for an approximate 100 acre site along Interstate 20. Co-directed with Richard Zartman (Plant and Soil Sciences).

Feasibility Study of Scale Removal Techniques for the Central System Pipeline, budget $50K, funded by Canadian River Municipal Water Authority. Project involved analysis of hydraulics of a 120-mile long pipeline carrying raw water for Plainview, Lubbock, and other municipal supplies. Further work required analysis of water quality data and chemical modeling to determine the source of carbonate scale which has reduced carrying capacity of the pipeline about 12 percent. Study recommended field-scale testing of carbon dioxide injection to reduce water pH below the saturation level of the carbonate scale. Subsequent dissolution and softening of the scale should result in regaining at least part of the capacity of the pipeline. Co-directed with Ken Rainwater.

Geologic and Hydrologic Site Characterization of the Pantex Plant, budget $1.1M, funded by U. S. Department of Energy. Supervised application of *STORM* to construct hydrologic budgets for playa lakes on the Pantex site. Project involved monitoring several weirs and raingages, collecting data from data loggers, and checking recorded data for accuracy. *STORM* was calibrated using measured data, and then used to extend meteorological records for estimating the long-term infiltration of water through playa lake sediments. Developed a water-budget model, *WaterBalance*, for computation of water budget of playa lakes and estimation of total infiltration during period of record from 1952–1991. Developed codes to read and use meteorologic data from several sources for computation of evapotranspiration using the FAO-24 Penman method. Co-director ed with Ken Rainwater, Heyward Ramsey, Tony Mollhagen, and Lloyd Urban.

Review of Selected Army Installations for Stormwater Runoff and Nonpoint Source Pollution, budget $25K, funded by Construction Engineering Research Laboratory, U.S. Army Corps of Engineers. Object was to determine stormwater research needs for Army installations. The project included a literature review to identify innovative and emerging technologies for control and mitigation of stormwater runoff and nonpoint source pollution. Additional work included travel to selected installations and review of best management practices as related to prevention of stormwater-generated pollution. The project focused on industrial areas of Army installations. Co-directed with Lloyd Urban.

Development of One-Dimensional Streamflow Model FOURPT, funded from U.S. Geological Survey project funds. Assisted development of the one-dimensional gradually varied streamflow model FOURPT, a portable finite difference code for solving the one-dimensional flow equations in river and estuarine environments. The model is intended for use both as a training tool for USGS personnel and as a production tool for district and public use. Design of the code emphasized portability and re-usability of program elements, and included use of utilities and database routines developed in the project described below. Co-developer was Lewis DeLong, USGS.

Development of Database Software for Hydraulic and Hydrologic Modeling, funded from USGS project funds. Designed and implemented a database for use in hydrologic and hydraulic models for storage and retrieval of time-series and space-series data. The system was designed using the principle of data encapsulation and completely implemented in standard FORTRAN, resulting in a very portable and robust utility. During the development process, a number of useful utility subprograms were developed and are available for use in many modeling codes.

Determining Parameters for a Continuous Simulation Model by Estimation, Calibration Using Measured Data, or Calibration Using Regional Regression Equations, (dissertation project), budget $14K, funded by USGS. This project was funded by the United States Geological Survey. It involved a modeling analysis of ungaged watersheds. Objective was twofold: to determine if models of ungaged watersheds can be used based on parameters estimated during site visits; to examine how well models of ungaged watershed perform using parameters estimated from calibration using regional regression equations as data base. Comparison of the results of the two procedures were made against each other as well as against results using measured data to optimize model parameters.

A Method for Simulating Hydrologic Budgets Using Meteorological Data and the SCS Curve Number Procedure, (M.S.C.E. thesis project), unfunded. Problem was to devise a method for estimating water budgets for small, ungaged watersheds which reflects soil moisture storage dynamics during the yearly period. Procedure developed used Monte Carlo simulation of daily rainfall, evapotranspiration estimates from

Thornthwaite method, and runoff estimates using SCS curve number scheme to compute a consistent (in the sense that soil moisture storage was considered) water budget.

SURFACE-WATER HYDROLOGY PROJECTS

Hydrologist and designer for Spooner Meadow project in the Lake Tahoe Basin in western Nevada in association with Wildscape Engineering. Developed flood frequency curves for North Creek watershed and Spooner Meadow to support hydraulic modeling and design. System is complicated because Secret Harbor Creek captures a most of the runoff from the North Creek watershed. Developed HEC-RAS 2D model to quantify flow split where North Creek and Secret Harbor Creek split. Then developed a second HEC-RAS 2D model to analyze and design restoration improvements for North Creek and Spooner Meadow.

Hydrologist for Hobart Mills Reservoir restoration project near Prosser Lake in northern California in association with Wildscape Engineering. Used USGS StreamStats to develop the flood frequency curves for the multiple sub-watersheds. Then constructed HEC-RAS 2-Dimensional hydraulic models to support designs for restoration efforts, which included contributions to the design effort. Designed replacement culvert crossing for Hobart Mills Road and reprofiling of the road to reduce likelihood of overtopping during flood events.

Hydrologist for Hoke Meadow restoration project near Stampede Reservoir in northern California in association with Wildscape Engineering. Used USGS StreamStats to develop the flood frequency curve for the main watershed and one subwatershed. Then used HEC-RAS 2-Dimensional hydraulic model of study reach to support restoration efforts.

Hydrologist for Mahogany Creek restoration project near Summit Lake, Nevada. Analyzed USGS streamgage records using Bulletin 17C and developed HEC-RAS 2-Dimensional hydraulic model of study reach to support restoration efforts.

Expert witness for Respondent, major bridge replacement arbitration (2022–2023). Provided forensic analysis and expert witness testimony regarding lake levels during construction in response to Claimant's claim against client. Arbitration case heard in 2023 and generally found in favor of the Respondent.

Expert witness for Defense, highway accident case in Houston, Texas (2023–2024). The claim against my client was vacated.

Expert witness for Respondent, major bridge replacement arbitration (2021–2022). Provided forensic analysis and expert witness testimony in response to Claimants claim of client delays. Case heard in 2022 and parties reached a settlement.

Expert witness for Defense, Ash Meadows National Wildlife Refuge (2017–2021). Provided forensic analysis and expert testimony concerning flood events that occurred in 2010, 2015, and 2016 that resulted in damage to one of the inholding properties on the refuge. Case went to trial in May 2021 and was found in favor the the Defendant (my client).

Hydrologic and hydraulic analyses for South Fork Silver Creek and Wilson Creek, El Dorado National Forest, El Dorado County, California, in association with Wildscape Engineering (2021). Responsible

for developing hydrology (flood frequency curves) for both watersheds, then developing a HEC-RAS 2-dimensional hydrodynamic model for design and analysis of proposed structures for a meadow restoration project.

Hydrologic analysis, Fort Bend County, in association with McLendon Hydraulic Engineers (2020). Developed an accounting model (water budget) for a small pond near Terrell, Texas to determine if sufficient storage was available to support fire fighting efforts for a small development.

Hydrologic support, Bijou Creek Restoration Project, in association with Wildscape Engineering (2020). Provided a review and analysis of the hydrologic work of another consultant. Supported Wildscape Engineering personnel with a variety of hydraulic designs.

Hydraulic modeling support, Cold Creek near Truckee, California, in association with Wildscape Engineering (2019). Developed a flood frequency curve for Cold Creek upstream from its confluence with Donner Creek, near Truckee, California. Using the FFC, developed a HEC-RAS model to provide support for a stream restoration of a segment of Cold Creek that is moving a plug of sediment downstream leftover from the hydraulic mining days and other disturbance of the watershed.

Expert for Plaintiff, *Cleous, et al, versus City of Reno, Nevada* (2018-2019). Provided expert witness support for case involving flooding of Plaintiff properties by actions attributable to City of Reno. Used basic hydrologic principles to estimate impact of development and effluent discharge on stage of Swan Lake. Case found in favor of my client (Plaintiff).

Conducted a hydrologic and hydraulic analysis for a pedestrian bridge over Arroyo Del Valle near Livermore, California, in association with Wildscape Engineering (2017–2018). The presence of a FEMA regulatory floodplain required development of a CLOMR before the project can be constructed. The FEMA Base Flood Discharge was based on the assumption of full discharge from Del Valle Dam upstream from the project site. This very conservative estimate by the FEMA contractor was examined by constructing a hydrologic model of the Del Valle Dam watershed and resulted in reduction of the Base Flood Discharge by more than 50 percent. A hydraulic analysis was completed and submitted to support a CLOMR application. The CLOMR was granted in 2019 and the structure was completed in 2019. Subsequently, the hydraulic modeling was revisited with the as-built plans of the structure. The application and supporting documentation was approved by FEMA the LOMR granted in 2021.

Provided hydraulic modeling and analysis for several restoration projects on Donner Creek, Truckee, California, in association with Wildscape Engineering (2017). Directed collection of field surveying to supplement LiDAR-based topography/bathymetry of a reach of Donner Creek. Developed flood frequency curve for the U.S. Geological Survey streamgage on Donner Creek near State Highway 89 and used those results as input to a HEC-RAS hydraulic model of the study reach of Donner Creek. Provide estimates of velocity and shear stress to Wildscape Engineering for design of bank protection and in-stream structures to mitigate high velocity, bed mobility, and bank erosion issues. Provided text and editing services for project report.

Conducted a hydrologic analysis of Tolay Lake and contributing watersheds to assess the impact of proposed restoration efforts on the potential for flooding and potential improvement of existing flood risks (2016–2017). Used HEC-HMS and a combination of field surveys and remotely-sensed data to construct

existing condition and a post-project (proposed) condition watershed models. Used the watershed models to assess impact of proposed improvements to lake outlet works on flood hydrology.

Provided expert assistance for development of an unsteady hydraulic model (HEC-RAS) to estimate the impact of an off-stream detention pond on flood hydrograph impacted by proposed adjacent development for McLendon Hydraulic Engineers (2017). Used the existing steady-state hydraulic model to develop interpolated cross sections to obtain a stable unsteady-state hydraulic model. Included the diversion weir (lateral structure) and storage area, then operated the model and made adjustment for stability and to confirm the detention requirement was met and that the system will operate as designed.

Pond outlet works hydraulics analysis and hydrologic analysis, McLendon Hydraulic Engineers (2017). Used HEC-RAS to construct the rating curve for a large detention pond, designed secondary spillway to lower normal pool elevation, then conducted hydrologic analysis of contributing watersheds to validate outlet work design.

Hydrologic analysis, Fort Bend County, McLendon Hydraulic Engineers. Used HEC-HMS to estimate flood frequency curve for a 5 square-mile watershed in Fort Bend County, Texas. Watershed delineation was challenging because topographic slope is nearly zero. Contributing area of the watershed was defined by bounding roadways and agricultural turn-rows. Time of concentration was unusually long because of low topographic slope.

Hydrologic analysis, Moss Lake, Texas, McLendon Hydraulic Engineers. Analyzed the lake response to a 100-year event using HEC-HMS to determine whether lake stage might affect culvert hydraulics for new culverts designed for five small watershed contributing to the lake. Conducted hydrologic analysis of five small watershed to provide design parameters for culvert crossings.

Friday's Station Pond dam safety analysis, Edgewood Properties, Inc (2014). I developed estimates for Probable Maximum Precipitation and Probable Maximum Flood using NOAA data for precipitation, NRCS soils data for infiltration characteristics, and HEC-HMS for the watershed model. ArcMap was used as the spatial data analysis platform. The 0.5PMF was used as the initial design event because of the presence of U.S. Highway 50 downstream from the structure. Incremental analysis was used to determine that the presence of the structure had no substantial effect on the risk to US50, so a 100-year design event could be used. HEC-RAS was used to breach the dam under a variety of failure modes and establish a downstream zone of inundation for preparation of an Emergency Action Plan.

Indirect measurements of July 2014 floods on Buckbrush Wash and Buckeye Creek, Douglas County, Nevada (2014). A staff engineer and I spent a couple of days in the field collecting high-water marks and cross sections so that estimates of peak discharge could be made for the streams of interest. I executed the computations to make the estimates and then wrote a technical memorandum to document the results.

Expert witness for defense, Ash Meadows National Wildlife Refuge (2013–2014). Provided forensic analysis and expert testimony concerning a flood event that occurred in December 2010, resulting in damage to one of the inholding properties on the refuge.

Feasibility-level design of flood control channel, Buckeye Creek floodplain, Douglas County, Nevada. We used the FEMA effective FLO-2D model of Buckeye Creek to develop the initial sizing of a flood capture channel for a parcel in Douglas County. The intent was to intercept sheet flow from the alluvial

fan floodplain and convey those discharges through a channel to a discharge point on the receiving water. HEC-RAS was used to size and analyze the channel downstream from the incoming flow and to size the culverts required for access to the parcel.

Floodplain analysis for Douglas County, Nevada, Senior and Community Center Conditional Letter of Map Revision. Used effective FLO-2D model of the East Fork Carson River and results of feasibility study to set grading plan and prepare submittal of an application for a Conditional Letter of Map Revision. The project was complicated by the presence of impacted structures in the floodplain. This resulted in a "no-rise" requirement for the project. Many iterations were required to permit flows to pass the proposed structure without impacting already affected structures. The project was successful and a CLOMR was issued by FEMA. The center has since been constructed and a LOMR issued by FEMA.

Floodplain analysis for Douglas County, Nevada, proposed Senior and Community Center. Used effective FLO-2D model of the East Fork Carson River to assess potential impacts of the footprint of the proposed center on the regulatory floodplain for a feasibility study. Results of the study were used to set the location of the prosed structure.

Flood hydrology of the upper Carson River. Tasked with developing estimates of 100- and 500-year flood events for use in flooding potential of the upper reach of the Carson River. The work was performed for Carson Water Subconservancy District under subcontract to HDR Engineering.

Hydrology of the Dayton Valley reach of the Carson River. Tasked with developing a hydrograph for the 100- and 500-year flood events for a 15-mile reach of the Carson River in Dayton Valley, Nevada. The work was performed for Carson Water Conservancy District under subcontract to HDR Engineering.

Field measurement of soil hydraulic properties for the alluvial fan watersheds in the Pine Nut Mountains, Carson Valley, Douglas County, Nevada. Used tension infiltrometers to make measurements of soil hydraulic properties for the alluvial fan watersheds along the east side of Carson Valley, Nevada. The purpose of the project was to develop scientific data to confirm saturated hydraulic conductivity of watershed soils for use in the Green-Ampt infiltration equation. Work performed for Douglas County, Nevada, and Carson Water Subconservancy District.

Simplified dam breach analyses of five NRCS flood-control structures in Brown County, Texas. Executed hydraulic modeling to complete simplified dam breach analyses of five small structures in Brown County, Texas. Performed as subcontractor for TRC, who acted as the prime contractor.

Flood hydraulics study of a portion of Buckbrush Wash alluvial fan. Conducted two-dimensional hydraulic modeling using FLO-2D of a portion of the alluvial fan downstream from the fan apex of Buckbrush Wash, Douglas County, Nevada after FEMA revision of base flood hydrology. A CLOMR application was prepared and approved on completion of the floodplain analyses.

Flood study of James Canyon, in Douglas County, Nevada. Conducted hydrologic and hydraulic analysis for a four square mile watershed to determine extent of flooding post-project after construction of a lined channel.

Investigation of flooding for a client in Reno, Nevada. Recent construction adjacent to the affected site might have impacted the historical flow path for flood flows from a portion of Thomas Creek in Reno,

Nevada.

Review of Flood Insurance Study (FIS) and Digital Flood Insurance Rate Maps (FIRMs) in Douglas County, Nevada. Technical review of hydrology and hydraulics for the 2008 revision to the Douglas County, Nevada FIS. Reviewed hydrologic modeling and assumptions, mapping revisions to the FIRMs for compliance with digital-FIRM mapping standards, and generated a report to document findings.

Flood study of Martin Slough from Stockyard Road to Toler Avenue, Towns of Minden and Gardnerville, Nevada. Flood hydraulics study using HEC-RAS and approximate methods to determine changes to base flood elevations and floodplain extent for most of Martin Slough, culminating with a report and a LOMR application submitted on behalf of Douglas County, Nevada.

Flood study of a reach of Martin Slough in Minden and Gardnerville, Nevada. Executed HEC-RAS models of Martin Slough to review Douglas County Flood Insurance Study. Determined impact of post-FIRM projects in study reach, assessed impact of proposed floodplain-fringe fill on base flood elevations, generated a project report, and prepared application for a CLOMR.

Expert for plaintiff: Reviewed drainage and flooding problem for a client in Reno, Nevada. Case settled in favor of plaintiff.

Hydrologist for water-rights applications in Carson Valley, Nevada. Analyzed 60 years of Carson River flow data to determine changes in flow conditions. Analysis in opposition to protests against the applications.

Flood study of Cottonwood Slough in Gardnerville, Nevada. Executed HEC-RAS model of Cottonwood Slough to review Flood Insurance Study and determine impact of fill on client's property. Prepared detailed report and application for a CLOMR.

Expert for defendant: Reviewed ground-water associated with foundation failure of homes in Laredo, Texas. Case settled.

Expert for plaintiff: Reviewed drainage design for a public school system in Las Cruces, New Mexico. Case settled in favor of plaintiff.

Multi-dimensional hydrodynamic model of Guadalupe River delta. Developed a two-dimensional flow model (RMA2) of lower Guadalupe River delta, analyzed low-flow patterns, and developed data collection plan to support further modeling. Project ended with preparation of engineer's report.

Expert for plaintiff: analyzed impact of gravel pack on groundwater well hydraulics. Case found in favor of defendant.

Designed detention pond and wrote drainage report for two-acre development in Abilene, Texas.

Expert for defendant: Analyzed flood patterns on development site using FESWMS two-dimensional hydrodynamic model. Case terminated.

Expert for defendant: Analyzed impact of bridge structure on river flow regime using FESWMS two-dimensional model. Case terminated.

Expert for plaintiff: Reviewed drainage conditions and impacts of changes by county government on plaintiff's property. Case terminated.

Expert for plaintiff: Conducted hydrologic and hydraulic analyses of flooding of homes in Timberlakes and Timberridge subdivisions in Montgomery County, Texas. Case terminated.

Expert for plaintiff: Conducted hydrologic analysis of flooding of house and out-buildings near Knott, Texas. Case terminated.

Conducted Phase II dam safety analyses for 20 Missouri Department of Conservation dams. Participated in site reconnaissance of dams, watersheds, and downstream environmental zones. Conducted surface-water analyses to determine adequacy of existing spillway structures. Performed simplified breach analyses to investigate downstream environmental classification. Reported results of investigations for inclusion in Phase II inspection reports.

Completed detailed dam breach analyses of four Missouri Department of Conservation dams. Conducted detailed analyses of results of rapid and complete breach of two earth embankments using National Weather Service Dam Break Flood Forecasting Model. Assisted with analysis of breach of two other dams. Wrote reports presenting results of analysis for two of the four embankments.

Prepared the hydrologic report for 1985 mining permit for NEMO Coal Company, Moberly, Missouri. Supervised preparation of hyetographs, infiltration capacity curves, and synthetic unitgraphs to assess relative impact of mining on the surface-water regime. Project culminated with the preparation of a written report.

Executed hydrologic and hydraulic studies in support of relocation of Middle Fork of the Little Chariton River for Associated Electric Cooperative, Moberly, Missouri. Conducted field surveys to determine river cross sections. Conducted modeling effort using HEC-1 and DAMBRK to determine existing conditions and the intermediate and long-term effects of relocating a one-half mile reach of the Middle Fork Little Chariton River.

Completed detailed dam breach analysis of Holiday Acres Lake near Moberly, Missouri. Developed inflow hydrographs and conducted HEC-1 dam breach modeling to reduce downstream hazard classification for the reservoir.

Completed detailed dam breach analysis of Raintree Plantation Dam. Developed inflow hydrographs and conducted HEC-1 dam breach analysis to reduce downstream hazard classification of the reservoir.

Executed dam safety analysis of Mineral Point No. 1 and No. 2 dams. Developed inflow hydrographs and designed broad-crested weir spillways for two barite tailings dams for Pfizer Chemical Company.

Completed feasibility-level design and cost estimate for a channelization study for Cherry Creek near Denver, Colorado. Conducted hydraulic analyses to determine channel geometry so that a cost estimate could be made. Developed cost estimate for earthwork, rip rap, and site fill activities to reduce the extent of the 100-year flood plain for an estimated flow rate of 50,000 cubic feet per second.

Executed hydrologic analyses and spillway design for Pond Creek mine tailings dam. Developed design flood and designed broad-crested weir spillways for a three-stage barite tailings dam. Estimated down-

stream flooding potential for catastrophic failure of existing tailings dam and sequential failure of existing and proposed dams for IMCO Mining Company, Potosi, Missouri.

Designed spillways for Tiff No. 1 and Tiff No. 2 mine tailings dams. Developed design flood and designed broad-crested weir spillways for IMCO Mining Company.

Prepared hydrologic report for mining permit for NEMO Coal Company, Moberly, Missouri. Developed hyetographs, infiltration capacity curves, synthetic unitgraphs, and runoff hydrographs for HEC-1 applications to examine effects of surface mining on peak flow and runoff volume for various return intervals.

Prepared hydrologic report for mining permit for Missouri Mining and Reclamation Company, Fort Scott, Kansas. Developed hyetographs and unitgraphs for HEC-1 applications to ascertain the effects of surface mining on peak discharge and runoff volume for various return periods.

Prepared hydrologic report for mining permit for Howard County Coal Company, Moberly, Missouri. Developed hyetographs, synthetic unitgraphs, and infiltration capacity curves for HEC-1 applications to evaluate the effects of mining on peak discharge and runoff volume for various return periods.

GROUND-WATER PROJECTS

Analyzed well hydraulics to support a water rights application for City of Gardnerville, Nevada.

Expert witness: analyzed impact of local groundwater on homeowner's foundation.

Analyzed high water table near surface-water impoundments in Thompson Park, Amarillo. Conducted field investigations, supervised drilling operation, conducted slug tests to determine aquifer properties, constructed a cross-sectional groundwater model, and designed french drain to reduce water table.

Well field analysis and design. Reduced data from pump tests and operated numerical ground-water model to analyze effects of various pumpage rates on potential surface of Missouri River alluvial aquifer.

Review of recommended remedial actions and analysis of underseepage beneath an off-stream peaking water supply reservoir. Reviewed reports and recommendations of previous consultants, supervised field investigations including soil boring and rock coring, packer testing, bailer tests, and monitoring well installation. Analyzed underseepage using flow net procedures and prepared a report summarizing findings.

Hydrologic analysis for mining permit for a coal mining company. Characterized, interpreted, and reported the expected impact of surface mining on the ground-water and surface-water flow system.

Design of excavation dewatering system. Designed a well point dewatering system for a coal storage pit excavation. Developed a computer model to determine pumping rates and the time required to dewater the excavation.

Impact analysis of coal strip mine on three-tier ground-water flow system. Reduced slug test data to estimate transmissivity and modeled each tier separately as an areal flow system. Operated a cross-sectional model to examine vertical potential distribution after mining for Associated Electric Cooperative, Moberly,

Missouri.

CIVIL ENGINEERING DESIGN PROJECTS

Reviewed and developed design standards for the Town of Mammoth Lakes, California. I was subcontracted by R.O. Anderson Engineering to collect data and execute statistical analyses of ground snow load, wind load, and frost depth for the town. It had been at least 30 years since the previous analyses were completed and the town updated their design standards. In addition, I reviewed their design standards for seismic load and provided updated data from U.S.G.S. The project resulted in a technical report.

Project Engineer for Ashbrooke Executive Park, a 200-acre office and light industrial subdivision in Arapahoe County, Colorado. Responsible for layout of one-acre lots and design of streets, sanitary sewers, and storm sewers, and supervision of compilation of construction drawings. This project involved several hydraulic analyses to determine location and extent of 100-year flood plain for two streams.

Project Engineer for Country Club Executive Park, a commercial subdivision in Arapahoe County, Colorado. Responsible for layout of lots and streets, flood plain encroachment study and initial designs of facilities for proposed development.

Project Engineer for land development projects. Responsible for initial layouts and flood plain analyses for feasibility level designs for 250 and 150 acres sites in Arapahoe County, Colorado.

Designer of Hunter's Ridge subdivision in Overland Park, Kansas. Designed streets, sanitary sewers, and storm drainage facilities, and developed construction documents.

Designer of Gatewood subdivision in Overland Park, Kansas. Designed streets, sanitary sewers, and storm drainage facilities, and developed construction documents.

Designer of sewage collection and interceptor system. Performed analysis of existing and projected sewage flows, conducted route surveys for engineering purposes, developed legal descriptions for easements, designed and prepared construction drawings, quantity estimates, and cost estimates for modifications to the sewage system of the City of St. James, Missouri.

Designer of sewage interceptor system. Conducted preliminary route location, surveys, easement descriptions, designs, construction drawings, quantity estimates, and cost estimates for sewage interceptors for the City of Richland, Missouri.

Designer of street improvements for the City of Cuba, Missouri. Crew chief for engineering surveys, reviewed property surveys, designed street improvements which included curb and gutter, asphalt paving, and drainage improvements, prepared construction drawings, quantity estimates and cost estimates, and completed field staking for construction of project.

Designer of Line Barnitz First Addition. Performed land and engineering surveys, designed lot layout, streets and drainage facilities for subdivision.

Designer of Pine Tree Road. Conducted engineering surveys, prepared design of major arterial street, including horizontal and vertical geometry, intersections, drainage, construction documents, and field staking for City of Rolla, Missouri.

Designer of Soest Road improvements. Conducted engineering survey, reviewed existing property descriptions, designed new street geometry and drainage facilities and developed construction documents for the City of Rolla, Missouri.

REFEREED PUBLICATIONS

Manoj, J.C., Fang, X., Yi, Young-Jae, Li, Ming-Han, Thompson, David B., and Cleveland, Theodore G., accepted. "Improved time of concentration estimation on overland flow surfaces including low-sloped planes," *Journal of Hydrologic Engineering*, ASCE.

Dhakal, N., Fang, X., Asquith, W.H., Cleveland, T.G., Thompson, D.B., 2013. "Rate-based and probabilistic estimation of the rational runoff coefficients," *Journal of Irrigation and Drainage Engineering*, Volume 18, Number 12, 1571–1580.

Dhakal, Nirajan, Fang, Xing, Asquith, William H., Cleveland, Theodore G., and Thompson, 2012. "Return period adjustment for runoff coefficients based on analysis in undeveloped texas watersheds," *Journal of Irrigation and Drainage Engineering*, Volume 139, Number 6, 476–482.

Dhakal, Nirajan, Fang, Xing, Thompson, David B., and Cleveland, Theodore G. Cleveland, accepted. "Modified rational unit hydrograph method and applications in texas watersheds," *Journal of Hydrologic Engineering*, ASCE.

Dhakal, N., Fang, X., Cleveland, T.G., Thompson, D.B., Asquith, W.H., and Marzen, L.J., 2012. "Estimation of volumetric runoff coefficients for Texas watersheds using land-use and rainfall-runoff data," *Journal of Irrigation and Drainage Engineering*, Volume 138, Number 1, 43–54.

Cleveland, Theodore G., Thompson, David B., Fang, Xing, and He, Xin, 2008. "Synthesis of unit hydrographs from a digital elevation model." *Journal of Irrigation and Drainage Engineering*, Volume 134, Number 2, 212–221.

Asquith, William H. and Thompson, David B., 2008. "Alternative regression equations for estimation of annual peak-streamflow frequency for undeveloped watershed in Texas using PRESS minimization," Scientific Investigations Report 2008–5084, Austin, Texas 40pp.[2]

Fang, Xing, Thompson, David B., Cleveland, Theodore G., Pradhan, Pratistha, and Malla, Ranjit, 2008. "Time of Concentration Estimated Using Watershed Parameters Determined by Automated and Manual Methods." *Journal of Irrigation and Drainage Engineering* ASCE, Vol. 134, No. 2, 202–211.

Fang, Xing, Thompson, David B., Cleveland, Theodore G., Pradhan, Pratistha, and Malla, Ranjit, 2008. "Variations of time of concentration estimates using NRCS velocity method." *Journal of Irrigation and Drainage Engineering* ASCE, Vol. 133, No. 4, 314–322.

Cleveland, Theodore G., He, Xin, Asquith, William H., Fang, Xing, and Thompson, David B., 2006. "Instantaneous unit hydrograph evaluation for rainfall-runoff of small watersheds in North and South Central Texas," *Journal of Irrigation and Drainage Engineering*, ASCE, Vol. 132, No. 5, pp. 479–485.

[2]The U.S. Geological Survey has a formal peer-review process. Publications that are subject to USGS review are read at the local level plus at least two colleague reviewers read every document.

Asquith, William H., Roussel, Meghan C., Cleveland, Theodore G., Fang, Xing, and Thompson, David B., 2006. "Statistical characteristics of storm interevent time, depth, and duration for Eastern New Mexico, Oklahoma, and Texas," U.S. Geological Survey Professional Paper 1725, Austin, Texas 299pp.[13]

Asquith, William H. and Thompson, David B., 2005. "Alternative regression equations for estimation of annual peak-streamflow frequency for undeveloped watershed in Texas using PRESS minimization," TxDOT Research Report 0–4405–2, TechMRT 27pp.[1]

Rainwater, K.A., Jackson, W.A., Ingram, W., Lee, C.Y., Thompson, D.B., Mollhagen, T.R., Ramsey, R.H., and Urban, L.V., 2005. "Field Demonstration of the Combined Effects of Absorption and Evapotranspiration on Septic System Drainfield Capacity," *Water Environment Research*, Vol. 77, No. 2, pp. 150–161.

Fang, X., Cleveland, T., Garcia, C.A., Thompson, D., and Malla, R., 2005. "Literature review on timing parameters for hydrographs," TxDOT Research Report 0–4696–1, Lamar University, Beaumont, Texas, 77710, 72pp.[1]

Asquith, William H. Meghan C. Roussel, Ted Cleveland, Xing Fang, and David B. Thompson, 2004. "Atlas of Storm Arrival Rate, Statistics of Storm Depth and Duration, and Dimensionless Rainfall Hyetographs for Eastern New Mexico, Oklahoma, and Texas." U.S. Geological Survey Water-Resources Investigations Report, Austin, Texas 78754-4733.[1]

Williams-Sether, T., Asquith. W.A., Thompson, D.B., Cleveland, T.G., and Fang, X., 2004. "Empirical, dimensionless, cumulative-rainfall hyetographs developed from 1959–86 storm data for selected small watersheds in Texas," U.S. Geological Survey Scientific Investigations Report 2004–5075, Austin, Texas, 131pp.[1]

Asquith, W.A., Thompson, D.B., Cleveland, T.G., and Fang, X., 2004. "Synthesis of rainfall and runoff data used for Texas Department of Transportation research projects 0–4193 and 0–4194," U.S. Geological Survey Open-File Report 2004–1035, Austin, Texas, 1050pp.[1]

Rainwater, K.A., Ramsey, R.H., and Thompson, D.B., 1999. "A Master's of Environmental Engineering Curriculum," *Journal of Professional Issues in Engineering*, 125(2) ASCE, pp. 40–46.

Westphal, J. A., Thompson, D. B., Stevens, Jr., G. T., Strauser, C. N., 1999. "Stage-Discharge Relations on the Middle Mississippi River," *Journal of Water Resources Planning and Management*, 125(1) ASCE, pp 48–53.

Wood, Warren W., Rainwater, Ken A., and Thompson, David B., 1997. "Quantifying Macropore Recharge: Examples from a Semi-Arid Area," *Ground Water*, NGWA, Volume 35, Number 6, pp 1097–1106.

DeLong, Lewis L., Thompson, David B., and Lee, Jonathan K., 1997. "The Computer Program FOURPT (Version 95.01) — A Model for Simulating One-Dimensional, Unsteady, Open-Channel Flow," Water Resources Investigations Report 97-4016, U.S. Geological Survey, Bay St. Louis, Mississippi, 69pp.[1]

Thompson, D.B., DeLong, L.L., and Fulford, J.M., 1992, "Data Encapsulation Using Fortran 77 Modules–A First Step Toward Object-Oriented Programming in Water Resources," Water Resources Investigations Report 92-4123, U.S. Geological Survey.[1]

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Thompson, D.B., Westphal, J.A., and Kopsky, R.J., Jr., 1993. "Smith's Infiltration Equation and Flooding Infiltrometers," *Engineering Hydrology: Proceedings of the 1993 National Conference on Hydraulic Engineering,* American Society of Civil Engineers, San Francisco, California, July 26–30, 1993, pp. 25–30.[1]

DeLong, L.L., Thompson, D.B., and Fulford, J.M., 1992, "Data Encapsulation Using Fortran 77 Modules," *Fortran Forum* Volume 11, Number 3, ACM, New York, pp. 11–19.[1]

Thompson, D.B., 1992, "Numerical Methods 101–Convergence of Hydrodynamic Models in Space and Time," *Proceedings of the Hydraulic Engineering sessions at Water Forum 1992*, American Society of Civil Engineers, Baltimore, Maryland, August 1–5, 1992, pp. 398–403.[1]

PRESENTATIONS:

Presented a series of invited seminars for the *Universidad Católica Boliviano* in celebration of the university's 50th anniversary in April 2016. Topics were based on results from research projects executed for Texas Department of Transportation from 1995 through 2012. Support was provided by the university and the U.S. State Department.

Kilgore, Roger M., Herrmann, George "Rudy", Thompson, David B., and Thomas, Jr., William O., 2016. "Incorporating climate change, risk and resilience into hydrologic design procedures for transportation," National Hydraulic Engineers Conference, Portland, Oregon, August 9–12, 2016.

Thompson, David B. and James, Edwin, 2013. "Revisiting Carson River Flood Hydrology," presentation to the Nevada Water Resources Association River Symposium, Sparks, Nevada, November 6, 2013.

Thompson, David B., 2011. "Site-specific estimates of potential evapotranspiration," presentation to Nevada Mining Association Environmental Committee, Reno, Nevada, December 8, 2011.

Thompson, David B., 2011. "Hydrologic routing — Applied hydrology for engineers and planners," presentation at C.V.I.C. Hall, Minden Nevada, January 13, 2011.

Thompson, David B., 2010. "Hydrograph convolution — Applied hydrology for engineers and planners," presentation at C.V.I.C. Hall, Minden, Nevada, December 9, 2010.

Thompson, David B., 2010. "Design Hyetographs — Applied hydrology for engineers and planners," presentation at C.V.I.C. Hall, Minden, Nevada, November 18, 2010.

Thompson, David B., 2010. "The Clark Unit Hydrograph Method — Applied hydrology for engineers and planners," presentation at C.V.I.C. Hall, Minden, Nevada, October 21, 2010.

Thompson, David B., 2010. "The NRCS synthetic unit hydrograph method — Applied hydrology for engineers and planners," presentation at C.V.I.C. Hall, Minden, Nevada, September 8, 2010.

Kilgore, Roger and Thompson, David B., 2010. "The joint probability of flooding at stream confluences — Results from the NCHRP 15–36 project," presentation at the National Hydraulic Engineer's Conference,

Park City, Utah, September 2, 2010.

Thompson, David B., 2010. "Loss-rate functions for select Texas watersheds," presentation at the National Hydraulic Engineer's Conference, Park City, Utah, September 2, 2010.

Thompson, David B., 2010. "Unitgraph Introduction, Part II — Sixth in a series of applied hydrology seminars," presentation at C.V.I.C. Hall, Minden, Nevada, August 12, 2010.

Thompson, David B., 2010. "Introduction to unit hydrographs — Fifth in a series of applied hydrology seminars," presentation at C.V.I.C. Hall, Minden, Nevada, July 8, 2010.

Thompson, David B., 2010. "NRCS TR–55 — Fourth in a series of applied hydrology seminars," presentation at C.V.I.C. Hall, Minden, Nevada, June 10, 2010.

Thompson, David B., 2010. "Regional regression equations — Third in a series of applied hydrology seminars," presentation at C.V.I.C. Hall, Minden, Nevada, May 13, 2010.

Thompson, David B., 2010. "Joint probability of flooding at stream confluences," presentation to U.S. Army Corps of Engineers, Hydrologic Engineering Center, Davis, California, April 16, 2010.

Thompson, David B., 2010. "The rational method — Second in a series of applied hydrology seminars," presentation at C.V.I.C. Hall, Minden, Nevada, April 8, 2010

Thompson, David B., 2010. "Introduction to seminar series — Applied hydrology for engineers and planners," presentation at C.V.I.C. Hall, Minden, Nevada, March 11, 2010.

Thompson, David B., 2010. "Concurrent flooding — drainage area analysis," presentation to California Water Environmental Modeling Federation, Asilomar Conference Center, February 22, 2010.

Thompson, David B., 2009. "LiDAR for topographic measurements," invited presentation to Carson River Coalition, December 15, 2009, Carson City, Nevada.

Thompson, David B., 2009. "A simplified look at concurrent flooding," seminar for California Water Science Center, U.S. Geological Survey, October 20, 2009, Sacramento, California.

Thompson, David B., 2009. "A simplified look at concurrent flooding," paper for AIH/AHS annual conference, August 30–September 2, 2009, Scottsdale, Arizona.

Thompson, David B., Dorman, Troy D., and Tummuri, Spandana, 2009. "Downscaling general circulation models for regional hydrologic studies," Nevada Water Resources Association annual conference, February 4–5, 2009, Reno, Nevada.

Thompson, David B., 2009. "Loss-rate functions for Texas," seminar for David Ford Consulting Engineers and guests, Sacramento, California, January 23, 2009.

Thompson, David B., 2008. "Watersheds, hydrographs, and timing parameters," seminar for R.O. Anderson Engineering, Inc. staff and guests. Minden, Nevada, November 13, 2008.

Thompson, David B., 2008. "Results from application of bivariate distributions and copulas to a prototyping dataset," presentation to NCHRP Panel 15–36, Washington, D.C., September 17, 2008.

Thompson, David B., 2008. "The Texas hydrologic method," seminar for Nevada Department of Transportation hydraulic engineers, Carson City, Nevada, April 10, 2008.

Thompson, D.B. and Al-Saadi, R., 2008. "Comparison of hyetographs from runoff-producing events for San Antonio," invited presentation to Transportation Research Board annual conference, Session 305, Hydrology, Washington, D.C., January 14, 2008.

Thompson, D.B., 2006. "Texas flood hydrology," presented at the Texas section ASCE meeting in Beaumont, Texas, April 19–21, 2006.

Thompson, D.B. and Herrmann, G., 2004. "Texas Hydrology and TxDOT Research," invited presentation to FHWA Hydraulic Conference, Asheville, North Carolina, September 1, 2004.

Thompson, D.B. and West, E., 1998. "Hydrology of urban playa lakes," presented at the Texas section ASCE meeting in Ft. Worth, Texas, September 10–11, 1998.

Thompson, D. B., 1997. "Convergence and Gradually-Varied Flow Models," presented at the Texas section ASCE meeting in Arlington, Texas, October 3–4, 1997.

Thompson, D. B. and Zartman, R. E., 1997. "Soil Erosion Along Highway 20 Near Longview, Texas," poster presentation, International Erosion Control Association Annual Conference, Nashville, Tennessee, February 25–28, 1997.

Thompson, D. B. and West, E., 1996. "Selection of Cross Sections for Water-Surface Profile Computations," presented at Texas section ASCE meeting in Beaumont, Texas, April 10–13, 1996.

Thompson, D. B. and Rainwater, K. A., 1995. "A Model of Playa Bottom Infiltration at the Pantex Plant," presented at the Water for Texas Conference in Austin, Texas, January 26–27, 1995, pp 635–639.

Thompson, D. B. and Medellin, M., 1994. "Comparison of Infiltration Equations Using Flooding Infiltrometer Data," presented at the national hydraulics conference on hydraulic engineering, ASCE, Buffalo, New York, August 1–5, 1994.

CONFERENCE PROCEEDINGS:

Manoj, K., Fang, X., Yi, Y., Li, M., Cleveland, T., and Thompson, D., 2012. "Estimating Time of Concentration on Low-Slope Planes Using Diffusion Hydrodynamic Model." *World Environmental and Water Resources Congress 2012*, pp. 360–371, doi: 10.1061/9780784412312.039.

Dhakal, Nirajan, Fang, Xing, Cleveland, Theodore G., and Thompson, David B., 2011. "Revisiting modified rational method," *Proceedings of the 2011 World Environmental and Water Resources Congress*, May 22–26, 2011, Palm Springs, California, digital publication (CD-ROM).

Kilgore, Roger and Thompson, David B., 2011. "Estimating joint flow probabilities at stream confluences using copulas," Transportation Research Board 90th Annual Meeting (January 23–27, 2011), Washington, DC, digital publication.

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Resources Conference, Providence, Rhode Island, May 16–21, 2010, digital publication (CD-ROM).

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Thompson, D.B., 2007. "Loss-rate parameters for selected Texas watersheds," presented at the American Institute of Hydrology Integrated Watershed Management conference, Reno, Nevada, 22–25 April 2007.

Cleveland, T.G., Thompson, D.B., Fang, X., and He, X., 2007. "Synthesis of unit hydrographs from a digital elevation model," in *Proceedings of the Texas Section American Society of Civil Engineers, Spring Conference*, April 12–14, Tyler, Texas, digital publication.

Thompson, D.B., 2006. "Texas flood hydrology," in *Proceedings of the Texas Section American Society of Civil Engineers, Spring Conference*, April 19–21, Beaumont, Texas, digital publication.

Tummuri, S. and Thompson, D.B., 2006. "Methodology of regional climate impact studies for west Texas and its importance," in *Proceedings of the Texas Section American Society of Civil Engineers, Spring Conference*, April 19–21, Beaumont, Texas, digital publication.

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Cleveland, T.G., He, X., Fang, X., Thompson, D.B. 2006. "Regressions Relating Watershed Physical Characteristics to Unit Hydrograph Parameters for Rainfall-Runoff Modeling in Central Texas" in *Coastal Hydrology and Processes*, Singh, V.P., and Xu, Y.J. eds., Water Resources Publications, Highlands Ranch, CO. pp 465–478.

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Xing Fang, Om B Gharty Chhetr, and David B. Thompson, 2004. "Synthesis Storm Drain Design," *Proceedings of the ASCE Texas Section Fall Meeting in Houston,* September, 2004.

Fang, X., Jianhua Fu, David Thompson, Theodore Cleveland, and William Asquith. "Unit Hydrograph Development for Texas Watershed Using Linear Programming." *Proceedings of the ASCE Texas Section Spring Meeting in Corpus Christi,* April 2–5, 2003.

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Thompson, D. B. and West, E. L., 1998. "Hydrology of Urban Playa Lakes," *Proceedings of the Fall Meeting, Texas Section, American Society of Civil Engineers,* Fort Worth, Texas, September 10–11, 1998, pp. 181–186.

Van Hooser, K. and Thompson, D. B., 1998. "Impact of Long-Range Water Management Planning for the Texas High Plains," *Proceedings of the Fall Meeting, Texas Section, American Society of Civil Engineers,* Fort Worth, Texas, September 10–11, 1998, pp. 187–191.

Peterson, R. E., Thompson, D. B., Dorman, T. M., and Kenyon, J. D., 1997. "Simulated Impacts on the Upper Brazos Watershed based on Doubled CO_2," *Eos Trans. AGU* 78(46), Fall Meet. Suppl., F453 (poster presentation).

Peterson, R. E., Thompson, D. B., Dorman, T. M., and Kenyon, J. D., 1997. "Impacts of climate change on the Upper Brazos watershed generated by GCM predictions," *Preprints, Tenth Conf. Applied Meteor.*, Reno, Nevada, 121–122.

Zartman, R. E., Thompson, D. B., and Ramsey, R. H., 1997. "Infiltration into differing playa lakes". *Agronomy Abstracts* 1997:311, presented to the American Society of Agronomy, October 26, Anaheim, CA.

Thompson, D. B., 1997. "Convergence and Gradually-Varied Flow Models," *Proceedings of the Fall Meeting, Texas Section, American Society of Civil Engineers,* Arlington, Texas, October 3–4, 1997, pp 124–129.

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