2019 U.S. SOCIETY ON DAMS ANNUAL CONFERENCE

Second City – Second Chances: Stories of Rehabilitation, Modification and Revitalization
Chicago Hilton
April 8-11, 2019
Dams and levees continue to provide essential public benefits including flood control, water supply, renewable energy, recreation, navigation, and habitat and environmental enhancement. The need to maintain and improve our aging infrastructure has been well publicized, making it important to also share the great success stories of restoration and upgrades for dams and levees.

The “Second City” of Chicago is the site for the 2019 USSD Annual Conference. The conference theme echoes Chicago’s history of rebuilding and modernization to adapt to changing public needs. Rehabilitation, modification, and revitalization of dams and levees give new life to these existing structures through increased public safety and new or enhanced benefits. Papers and presentations addressing the conference theme and other technical topics remind ourselves and the greater community of the value of, and need for, dams and levees in society.

**Conference Topics**

- Conference Theme: Second City, Second Chances: Stories of Rehabilitation, Modification, and Revitalization
- Advocacy and Public Awareness
- Concrete Dams
- Construction and Rehabilitation
- Dam Safety
- Earthquakes
- Embankment Dams
- Environment and Sustainability/Dam Decommissioning
- Foundations
- Hydraulics and Hydrology
- Levees
- Monitoring of Dams and their Foundations
- Public Safety, Security and Emergency Management for Dams

The conference and exhibition will include a legacy presentation, USSD committee meetings, and plenary and concurrent technical sessions. Events throughout the week will offer plenty of networking opportunities.
Legacy Lecture Series

Monday, April 8th: 8:30am – 12:00 noon

Dr. Donald Bruce, President of Geosystems, L.P. will be the speaker for this continuing series designed to provide an opportunity for esteemed professionals to discuss projects, people, thoughts, and paradigm shifts that led to their advancements.

Moderator – Dr. Brian Greene

The Foundations Committee has initiated, in what is hoped to be a continuing series of USSD workshops/seminars, a forum to recognize and highlight the professionals that have pioneered substantial advances in the field of dam safety and dam engineering. These forums are designed to provide an opportunity for esteemed professionals to discuss projects, people, thoughts, and paradigm shifts that led to their advancements. It is an opportunity for the entry level individual and the seasoned professional to listen and learn from these masters of the profession. In addition to the technical presentation, a colleague of Dr. Bruce, Dr. Brian Greene, will lead a one-on-one interview of Dr. Bruce. This will be followed by a time of questions to Dr. Bruce from the audience.

Donald A. Bruce, Ph.D., C.Eng., D.GE, L.G., L.E.G., is President of Geosystems, L.P. He specializes in geotechnical construction processes, particularly anchoring (his Ph.D. dissertation topic), drilling and grouting. He has over 42 years of experience in dam anchoring and works on projects throughout North America and four other continents. Donald is active in many technical committees and is the former Chairman of the Geo-Institute’s Grouting Committee and Honorary Chairman of the International Society for Micropiles. He is also an active member of PTI’s Committee on Rock and Soil Anchors and is a co-author of the past (1996, 2004) and new (2012) Anchor Recommendations.

In addition, Dr. Bruce has authored or co-authored more than 300 technical papers for journal and conference publications and is co-author of Dam Foundation Grouting, and a new book Specialty Construction Techniques for Dam and Levee Remediation. Dr. Bruce has won numerous awards, including the Kapp, Baker and Terzaghi Awards from ASCE.

Learning Objectives:

- Examples of the aspects of critical thinking in the understanding and development of solving unique and challenging problems.
- Transfer of knowledge by an esteemed professional through the use of project examples, case histories, and other examples.
- Fostering technical competency
Workshops – Thursday, April 11th

All workshops are included with full conference registrations or can be purchased separately. Workshops are either full-day or half-day as noted in the description. You will be asked to select noncurrent workshops to attend on the registration form.

Flood Consequence Estimation with HEC-LifeSim
(full-day)

Several Federal agencies and dam / levee owners have made significant efforts over the last decade to understand and quantify the risk of their dam and levee portfolios. The dam and levee safety community is relatively familiar with potential failure mode analysis and estimating failure likelihoods, but there is less familiarity with estimating the consequences of failure.

Risk is estimated through the combination of the probability of an event, the performance of the structure, and the consequences of failure. Quantifying consequences can be done in varying levels of detail and there are several tools available to perform these estimates. USSD is proposing a series of workshops for the dam engineering community to gain familiarity in using these tools. The focus of the first in this series is the US Army Corps’ model, HEC-LifeSim, which provides a detailed look at flood impacts and evacuation. Future workshops may cover: RCEM (US Bureau of Reclamation), the Life Safety Model (HR Wallingford), and the “Dutch method” (Dr. Bas Jonkman).

The 8-hour, hands-on workshop is designed for dam and levee owners and regulators, hydraulic engineers, consequence modelers, and young professionals to get familiar with the software and its uses. The workshop includes the following topics:

- Risk Assessment Process Overview
- How to Quantify Consequences
- Building a HEC-LifeSim Model (Structures, Floodplains, Warning and Evacuation)
- Application of the Model Results
- Review of a Historic Flood
Introducing ICOLD Bulletin 177
on Roller Compacted Concrete
(morning)

The USSD Committee on Concrete Dams is organizing a workshop to introduce a new ICOLD Bulletin on Roller-Compacted Concrete finalized in 2018. The purpose of this Bulletin is to present the current state-of-the-art practice on roller-compacted concrete (RCC) for dams. During the workshop, primary authors of the Bulletin chapters will be giving presentations on design and construction of RCC dams.

The 2018 Bulletin addresses all aspects of the planning, design, construction and performance of RCC in dams, with specific topics related to mix proportioning and quality control. Many aspects of RCC dam construction have become better understood since the 2003 publication of Bulletin 126. The new Bulletin contains more comprehensive information particularly in relation to design, mixture proportioning, and construction. With a greater understanding of the requirements of successful RCC dams, as well as the pitfalls and difficulties associated with RCC dam design and construction, an effective discussion can be utilized.

Workshop Organizing Committee:

Dr. Jerzy Salamon  Bureau of Reclamation
Mr. Mike Rogers  Stantec
Dr. Quentin Shaw  ARQ

Agenda:

8:00 AM

Welcome - Jerzy Salamon – USSD Committee on Concrete Dams Chair
Purpose of the Bulletin - Quentin Shaw – Bulletin 177 Subcommittee Chair
Background and Design of RCC Dams - Quentin Shaw
Key New Developments of the RCC Technology - Quentin Shaw
RCC Mix Design -Tim Dolen (Dolen and Associates)
Construction of RCC Dams - Rafael Ibanez de Aldecoa (Dragados)

9:50 AM

Break

Quality Control -Tim Dolen
Performance of RCC Dams -Tim Dolen
Other Applications of RCC - Mike Rogers
Summary - Quentin Shaw
Application of the Bulletin to the US Practice - Kenneth Hansen (Consultant)
Workshop Closeout - Jerzy Salamon
Threshold and Action Levels
Workshop
(morning)

Workshop Description

When used effectively, threshold and actions levels can help dam owners and engineers identify instrument readings outside the expected range and trigger action when needed. Potential action includes reading verification, engineer evaluation, formal investigation and implementation of risk reduction measures. Threshold and action levels should be customized for each dam based on owner needs, potential failure modes of the dam and available instrumentation. Because the use of threshold and action levels varies greatly between different dams and owners, there is some confusion about how these tools should be developed and used as part of a dam safety program. To help workshop participants understand the various uses of threshold and action levels, this workshop will include presentations, case studies and panel discussion from four federal agencies, dam owners and consulting engineers.

Workshop Objective

Workshop attendees will learn how threshold and action levels can be an effective safety tool for dams of varying type, size and complexity.

Primary Audience

Dam owners, consultants, and regulators

Agenda

Introduction (8-8:30)

- Overview of how monitoring is an integral part of a dam safety program
- Introduction of threshold and action levels as a dam safety tool
- Review of key terms
- Consideration of instrument accuracy and precision

How to develop threshold and action levels (8:30-10:00)

- Approaches
  - Design basis
  - Historic range
  - Expected performance
• How to use as a tool for dam safety
  – Construction vs. Long-term performance monitoring
  – Monitoring Potential Failure Modes (PFMs)
  – Identifying unexpected performance (general health monitoring)
• Advanced concepts
  – Automated monitoring and alarms
  – Varying thresholds based on pool level, activity of other sensors, time, rate of change
• Agency approaches
  – USACE
  – USBR
  – FERC
  – TVA

Break (10:00-10:30)

Case Studies: Successful application of threshold and action levels (10:30-11:30)

• Case studies presented will be diverse with regard to:
  – Federal agency, private owner and consultant
  – Type and size of dam
  – Type of monitoring system
  – Approach to developing threshold and action levels
  – One case study will highlight a state of the art monitoring system that triggers alarms when threshold and action levels are exceeded

Panel Discussion/Wrap-up (11:30-12:00)

• Participants will be able to submit questions throughout the workshop and during the panel discussion
Seismic Evaluation of Concrete Dams
(afternoon)

Seismic analyses of concrete dams are becoming more dependent on advanced modeling techniques as the needs of the industry advance. The relative scarcity of data related to the performance of dams subjected to extreme seismic events limits verification of analytical tools and analysis results. Recognizing this constraint, solicitation of opinions among researchers and practitioners about the current state-of-practice in seismic analysis of concrete dams is warranted. It is essential to verify the consistency of the analysis results for the considered potential failure modes.

The primary objectives of the workshop are:
1. Review, summarize and interpret past USSD workshop outcomes.
2. Evaluate accuracy of analysis methods used in the seismic analysis of concrete dams.
3. Identify research priorities for both public safety and the needs of dam owners.
4. Solicitation of opinions among researchers and practitioners about the current state-of-practice in seismic analysis of concrete dams regarding whether analysis results are consistent with observed performance and whether the right potential failure modes are being addressed.

The USSD Committee on Concrete Dams and the Earthquake Committee organized a workshop during the 2018 USSD Conference in Miami on the Evaluation of Numerical Models and Input Parameters in the Analysis of Concrete Dams. The workshop was attended by dozens of professionals representing the engineering industry and academia, dam owners, and the dam safety community. The 2019 session is a continuation of the previous workshops held every year since 2016 on the aspects related to the structural analysis of concrete dams.

Workshop Organizing Committee:
- Dr. Jerzy Salamon, Bureau of Reclamation
- Dr. Lelio Mejia, Geosyntec Consultants
- Mrs. Hillery Venturini, Bureau of Reclamation

Agenda:

1:00 PM Welcome

- Presentation of 2018 Workshop Results
- Lessons Learned from the Past USSD Workshops
- Further Investigations identified by the Workshop Participants

3:00 PM Break

3:15 PM Open Discussion on: current state of practice and accuracy of the advanced analyzes of concrete dams, priorities for further evaluations of analysis methods

5:00 PM Adjourn
Communication during and immediately preceding an emergency is a critical step of response and recovery necessary to protect public safety and minimize damages. In these scenarios, key technical information must be communicated quickly, clearly, and concisely to varied, non-technical audiences with differing concerns and perspectives. Direct communication from dam owners and their agents is the best way to properly inform and reassure these affected parties, which include emergency responders, government officials, construction workers, and the general public.

This workshop aims to refine communication skills through presentations, a real-life case study with experienced emergency responders, discussions, and a group activity. Participants will learn and rehearse best practices for communication of critical, precise information under emergency conditions to facilitate public safety, risk reduction, and damage mitigation. This workshop offers an opportunity for participants to practice seemingly obvious skills in a controlled environment to be better prepared should the unthinkable happen, when judgment can be hampered by stress, urgency, and fatigue.

Workshop objectives include:

- Parsing technical information for non-technical stakeholders (e.g. emergency responders, government officials, construction workers, the public, etc.)
- Succinct messaging in high-stress, time-sensitive situations
- Understanding and avoiding mass panic
- Upsides and downsides of social media
- Lessons learned from past emergencies

By attending this workshop, the attendees will learn strategies for efficient, audience-oriented communication in emergency scenarios.
The $3.6-billion Tunnel and Reservoir Plan (TARP) Project in Chicago is a mega project, one of the largest civil engineering projects ever undertaken in terms of scope, cost and timeframe.

Morning tour – 8 am to 11:45 am

Afternoon tour – 1 pm to 4:45 pm (note: if there is sufficient interest, one bus will stop at Lagunitas Brewing Company, returning to the hotel approximately 6:15 pm.

Each tour will visit the Thornton Composite Reservoir and McCook Reservoir, features of the Chicago’s TARP project. At Thornton, participants will visit an overlook where they’ll see the reservoir, rock dam, RCC dam and gate shaft. At McCook Reservoir, participants will see the mining operation under construction in Phase 2, and the reservoir, completed in 2017 as part of Phase 1. Engineers from the Metropolitan Water Reclamation District of Greater Chicago will be on the motor coaches and at each project site to explain the project and answer questions.

The $3.6-billion Tunnel and Reservoir Plan (TARP) Project in Chicago is a mega-project - one of the largest civil engineering projects ever undertaken in terms of scope, cost and timeframe. TARP was conceived to reduce pollution and flooding in the metropolitan Chicago area, and to reduce the harmful effects of flushing raw sewage and other contaminated water into Lake Michigan by diverting storm water and sewage (combined sewer overflow, CSO) into temporary
holding reservoirs until it can be pumped to existing plants for treatment. Commissioned in the mid-1970s, the project is managed by the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC). Completion of the system is not anticipated until 2029 though substantial portions of the system have already been opened and are currently operational. The 2019 USSD Conference field tour will visit the Thornton Composite Reservoir (TCR) and McCook Reservoir.

The TCR is located in the former north lobe of the Thornton Quarry and is estimated to provide $40 million per year in flood damage reduction benefits to 556,000 people in 56 communities. This 7.9- billion- gallon capacity CSO reservoir serves the Calumet System south of Chicago and has been in operation since November 2015. A 2,700-ft long and 300-ft high Rock Dam separates the north lobe from the active portion of the quarry and supports Interstate I-80/294, a key highway within the Tri-State region. In the center of the Rock Dam, is a 109-foot-high roller compacted concrete (RCC) gravity dam, called the Gap Dam. The RCC Gap Dam spans a former haul route through the Rock Dam to complete the full height water barrier between TCR and the active main lobe of the quarry. A double-row grout curtain was constructed around the perimeter of the TCR to prevent exfiltration of reservoir waters into the surrounding areas.

McCook Reservoir is being developed in two phases to serve the Mainstream and Des Plaines Systems, approximately 252 square miles of Chicagoland surface area. Phase I was completed at the end of 2017 and Phase II is under construction with mining underway to form the reservoir. The total capacity of the reservoir will be 10 billion gallons and bring an estimated $90 million per year in flood damage reduction benefits to 3.1 million people in 37 communities.
Conference Closing Party- Wednesday, April 10th

The conference closing party will take place at The Crystal Gardens, an indoor 1-acre botanical garden at historic Navy Pier. Event ticket is included with all full conference and guest registration fees. Additional tickets can be purchased online or at registration.

Partake in the Chicago themed food stations and bars while exploring the many entertainment surprises waiting for you throughout the gardens. A great way to unwind after your technical sessions and before sitting in workshops or participating in the field tour.

Sponsorships

Expand your marketing efforts and increase your ROI by supporting USSD through an exclusive sponsorship. Join companies like HDR and Phillips & Jordan! Sponsorship information can be found in the Exhibitor and Sponsorship Prospectus at www.ussdams.org
5k FUNds Run—Wednesday, April 10th @ 6:30am

Run, walk, or be a virtual runner and sleep in. The 5th Annual 5k FUNds Run will take place in Grant Park on Wednesday, April 10th. Net proceeds benefit the USSD Scholarship Program. Registration is separate from the conference registration and will open on Nov. 14th. Race registration is $40 until March 27th; $50 after March 27th. Register and pay for the 5k FUNds Run separately. Register online at www.usssdam.org/event-3133349.

Become a Partner in Education Donor and support the USSD Scholarship Program! For $350, donors will get their logo on the 5k Race poster that will be displayed on the conference website, on the event mobile app, and at the conference. Partner in Education Donors also receive one free race registration.

Hotel Information and Registration

The conference hotel is the Hilton Chicago with an additional room block at the nearby Congress Plaza Hotel. Room blocks are filling up quickly, so don't delay.

Hilton Chicago 720 So. Michigan Ave. 877-865-5320 $229 + tax
Congress Plaza Hotel 520 So. Michigan Ave. 800-635-1666 $120 + tax

Cancellation Policy

Conference attendee cancellations must be received by email in order to receive full refund (less cancellation fee) prior to March 15, 2019. No refunds after March 15th, however substitutions are permitted. Cancellations between January 1-March 14, 2019 without substitution are subject to a $50 cancellation fee.

For More Information:

Conference Planning Chair: Rachael Bisnett, rachael.bisnett@stantec.com
USSD Executive Director Sharon Powers: sharon@ussdams.org
USSD general or conference information: Tonia Bengtson, Member Services Coordinator: tonia@ussdams.org; 303-792-8753
### Monday, April 8

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<tr>
<td>8:30 am - 12 noon</td>
<td>Conference Opening Session – Legacy Lecture Series: Dr. Donald Bruce, President of Geosystems, L.P.</td>
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<tr>
<td>1:30 pm - 3:30 pm</td>
<td>Committee Meetings Session 1</td>
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<td>4:00 pm - 6:00 pm</td>
<td>Committee Meetings Session 2</td>
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<tr>
<td>6:00 pm - 7:30 pm</td>
<td>Kickoff Reception and Exhibition Opening</td>
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### Tuesday, April 9

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<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>8:30 am - 10:15 am</td>
<td>Plenary Session 1</td>
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<tr>
<td>10:15 am - 10:45 am</td>
<td>Break in Exhibit Hall</td>
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<td>10:45 am - 12:15 pm</td>
<td>Concurrent Technical Sessions Track 1</td>
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<tr>
<td>12:15 pm - 1:30 pm</td>
<td>Lunch in Exhibit Hall</td>
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<tr>
<td>1:30 pm - 3:30 pm</td>
<td>Concurrent Technical Sessions Track 2</td>
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<tr>
<td>3:30 pm - 4:00 pm</td>
<td>Break in Exhibit Hall</td>
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<tr>
<td>4:00 pm - 6:00 pm</td>
<td>Poster Session in Exhibit Hall</td>
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<td>6:00 pm - 7:30 pm</td>
<td>Reception in Exhibit Hall</td>
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### Wednesday, April 10

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<th>Time</th>
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<tr>
<td>8:30 am - 10:15 am</td>
<td>Plenary Session 2</td>
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<tr>
<td>10:15am - 10:45am</td>
<td>Break in Exhibit Hall</td>
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<tr>
<td>10:45am - 12:15 pm</td>
<td>Concurrent Technical Sessions Track 3</td>
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<tr>
<td>12:15 pm - 1:30 pm</td>
<td>Lunch in Exhibit Hall</td>
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<tr>
<td>1:30 pm - 3:30 pm</td>
<td>Concurrent Technical Sessions Track 4</td>
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<tr>
<td>3:30 pm - 4:00 pm</td>
<td>Break in Exhibit Hall</td>
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**Thursday, April 11**

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<th>Time</th>
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<tbody>
<tr>
<td>8:00 am - 11:45 am</td>
<td><strong>TARP Project Field Tour (extra fee)</strong></td>
</tr>
<tr>
<td>8:00 am - 12:00 noon</td>
<td><strong>Workshop 1: Flood Consequence Estimation with HEC-LifeSim</strong></td>
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<tr>
<td>8:00 am - 12:00 noon</td>
<td><strong>Workshop 2: Introducing ICOLD Bulletin 177 on Roller Compacted Concrete</strong></td>
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<tr>
<td>8:00 am - 12:00 noon</td>
<td><strong>Workshop 3: Threshold and Action Levels</strong></td>
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<tr>
<td>11:30 am - 1:30 pm</td>
<td><strong>Lunch in Salon A</strong></td>
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<tr>
<td>1:00 pm - 4:45 pm</td>
<td><strong>TARP Project Field Tour (extra fee). If there is enough interest, one motorcoach will stop at Lagunitas Brewing Company before returning to the hotel.</strong></td>
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<tr>
<td>1:00 pm - 5:00 pm</td>
<td><strong>Workshop 1: Flood Consequence Estimation with HEC-LifeSim (continued)</strong></td>
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<tr>
<td>1:00 pm - 5:00 pm</td>
<td><strong>Workshop 4: Seismic Evaluation of Concrete Dams</strong></td>
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<tr>
<td>1:00 pm - 5:00 pm</td>
<td><strong>Workshop 5: Emergency Communication Primer</strong></td>
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In the Exhibit Hall

* Discover the latest in products and services from top industry exhibitors
* Networking opportunities abound during breaks, lunches, and receptions
* Conference attendees can earn points and win prizes with the new USSD Gamification
* Exhibitors will compete for ‘Best in Show’ and ‘Most Creative’ awards
* USSD Pavilion is the place to meet colleagues and recharge your devices
Seepage-Induced Internal Instability Testing for Dam Safety Assessments
Paul Slangen, Geosyntec
Jonathan Fannin, University of British Columbia

Comparison of Methodologies for Evaluating Internal Erosion of Earthen Embankment Dams Using a Case Study
Clinton Carlson, Geosyntec
Wesley MacDonald, Geosyntec
Glenn Rix, Geosyntec
Lucas DeMelo, Geosyntec
Caleb Douglas, TVA

Numerical Approach to Modeling Internal Erosion in Embankment Dams and Levees
Biswajit Dasgupta, Southwest Research Institute
Gordon Wittmayer, GNO Modeling Research

Study of Embankment Cracking for Small Dams
Ana Avendano, Universidad Nacional de Colombia
Guillermo Avila, Universidad Nacional de Colombia

Selection Factors and Performance of Overtopping Protection Alternatives
Jeremy Young, Schnabel Engineering
Thomas Hepler, Schnabel Engineering

Vector-Dependent Hazard for Liquefaction Assessment at a Dam Site
Melanie Walling, GeoEngineers

Developing Design Ground Motions for the Expansion of Gross Reservoir
Christine Weber, Stantec
Dina Hunt, Gannett Fleming

State-of-the-Art Dam-Foundation Interaction Procedure for Non-linear Arch Dam Analysis
Guirinderbir Singh Sooach, Hatch
Dan Curtis, Hatch

Crossvalley Performance of Piers
Iman Ghorbani, Hatch
James Rutherford, Hatch
John Werner, Hatch
Max Mantola, Hatch
John Stanton, University of Washington

Harpreet Hansra, DRW, Division of Safety of Dams
Vojislav Cvijanovic, California DRW, Division of Safety of Dams
Ian Maki, DRW, Division of Safety of Dam

Santee Cooper Upstream Slope Protection Project – An Owner’s Perspective
Denise Bunte-Bisnett, Santee Cooper
John Osterlie, WSP

Extreme Repurposing: from Guard Wall to Cofer Wall to Dam at Monongahela River
Locks and Dam No. 4,
Timothy Hampshire, DLZ National, Inc.

Evaluation and Stabilization of Steep Rock Slopes to Mitigate Rockfall Hazard during Construction
Erik Newman, AECOM
Holly Nichols, California DWR
Jennifer Dean, California DWR
Nicholas Hightower, California DWR
Andrew Tate, California DWR
Jennifer Bauer, Appalachian Landslide Consultants

Case Study: Silver Basin Reservoir/First Asphalt-Core Dam Built in United States
Tony Rathbun, Ames Construction
Dawn Culley, Rhyolite Engineering Inc

Cedar Rapids, Iowa – A Second Chance for a Flooded City
Matthew Redington, HDR
Michael Butterfield, HDR

Gate Dynamic Analysis Using CFD
Joe Groeneveld, Hatch
Associates Consultants, Inc.
James Rutherford, Hatch
Associates Consultants, Inc.
John Werner, Hatch
Associates Consultants, Inc.
Iman Ghorbani, Hatch
Associates Consultants, Inc.
Namho Kim, Hatch
Associates Consultants, Inc.
Nikou Jalayeri, Hatch
Associates Consultants, Inc.

Performance of a Wire Rope Hoist Leaf Gate during Emergency Closure (Unbalanced Loading)
Nathan Cox, McMillen Jacobs Associates
Ethan Thompson, U.S. Army Corps of Engineers

Physical Model of Spillway and Reservoir Debris Interaction
Kent Walker, US Bureau of Reclamation

Flow Modeling of a Steep, Curved Spillway Chute
Abbas Dorostkar, HDR
Sarah Christian, HDR

Using Stochastic Modeling to Assess Operational Risk at Center Hill Dam
Jim Garner, USACE
David Bogema, USACE

Risk Considerations For Reconstruction of Nepal Hydroelectric Project Damaged by Landslides, Earthquakes and Flooding
Michael Bruen, Stantec
Zbigniew Matus, Stantec
Bikram Shapit, Bhate Kashi Power Corporation

Upgrades for a Second Century at Duke Energy’s Bridgewater Hydroelectric Project
Brian Reinicker, HDR
Brian Chrismas, HDR
Brad Keaton, Duke Energy
Jon Wise, Duke Energy
David Gerlach, HDR

Buckeye Lake Dam Remediation: Unique Design & Construction at a Unique Structure
Boyd Howard, Gannett Fleming, Inc.
Robert Kline, Gannett Fleming, Inc.
Daniel Store, Gannett Fleming, Inc.
John Rutledge, Department of Natural Resources

From Ideal to Unconventional: Case Study of the Atoka Dam and Spillway Rehabilitation
Brad Kirksey, Freese & Nichols, Inc.
John Rutledge, Freese & Nichols, Inc.
Nicolle Wiesner, Freese & Nichols, Inc.
Laurie Haas, Oklahoma City Water Utilities Trust
Andrew Mishler, Oklahoma City Water Utilities Trust

A Rehabilitated Outlet for St. Charles No. 2
Micah Smidt, RJH Consultants, Inc.
Michael Graber, RJH Consultants, Inc.
Eric Hahn, RJH Consultants, Inc.
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<td>3A: Embankment Dams II</td>
<td>Room: Salon A2</td>
<td>Moderators: Clinton Carlson, Geosyntec Consultants; and Chris Krage, GEI Consultants</td>
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<tr>
<td>3B: Environment/Decommissioning</td>
<td>Room: Salon A4</td>
<td>Moderators: Ali Reza Firoozfar, HDR; and Glen DeWillie, Kleinschmidt Group</td>
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<tr>
<td>3D: Dam Safety II</td>
<td>Room: Salon A3</td>
<td>Moderators: Emily Schwartz, Black &amp; Veatch; and Miguel Rocha, Bureau of Reclamation</td>
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<td>3E: Conference Theme II</td>
<td>Room: Salon A5</td>
<td>Moderators: Seth Krause, WSP; and Andrew Verity, Terracon Consultants</td>
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### 3A: Embankment Dams II

**Room: Salon A2**

**Moderators:** Clinton Carlson, Geosyntec Consultants; and Chris Krage, GEI Consultants

- **Numerical Evaluation of Strain-Rate Effects on Strain-Softening and Localization in Saturated Clays**
  - Tyler Oathes, University of California, Davis
  - Ross Boulanger, University of California, Davis

- **Weak Rock Foundation Characterization From Laboratory Cyclic Testing**
  - Evan Lindenbach, Bureau of Reclamation
  - Richard Bearce, Bureau of Reclamation

- **Determination of Material Properties for a Fine-grained Embankment**
  - Foundation Layer
    - Robert Rinehart, Bureau of Reclamation
    - Peter Irey, Bureau of Reclamation
  - **Dam Demcomissioning in Mississippi: Maintain It or Drain It**
    - Johnathan Atkins, MS DEQ

- **Making an Entrance - Security Upgrades at the Entrance to Boundary Hydroelectric Project**
  - Brandan Vavrek, Seattle City Light
  - Jon Gray, Seattle City Light

- **Public Safety - Emergency Management in a Crisis**
  - William Foos, Gannett Fleming
  - Matthew Balven, Gannett Fleming

- **CFD Modelling to Evaluate and Improve Public Safety Around Dams**
  - Benjamin Israel Devadason, Gannett Fleming, Inc.
  - Paul Schweiger, Gannett Fleming, Inc.

- **Biodynamic Responses for Evaluation of Public Safety at Dams**
  - Brian Crookston, Utah State University
  - Steven Barfuss, Utah Water Research Laboratory

- **How to Make a Business Case to Justify Dam Safety Improvements?**
  - Ali Reza Firoozfar, HDR
  - Keith Moen, HDR
  - Adam Jones, HDR

- **Decision Making in Dam Engineering**
  - Daniel Osmun, HDR
  - William Fiedler, HDR

- **Predicting High Dam Flood Discharge-Induced Ground Vibrations with Improved Stochastic Transfer Functions**
  - Yan Zhang, China Institute of Water Resources and Hydropower Research
  - Guoxin Zhang, CIWRHR
  - Yi Liu, CIWRHR
  - Songhu Li, CIWRHR

- **Safety Culture - What is It and How it Will Help Improve Dam Safety**
  - Ahmad Faramarzi, Analysis Planning and Management Institute, Inc.
  - Charles Hutton, Hutton Consulting
  - Miguel Rocha, USBR

### 3B: Environment/Decommissioning

**Room: Salon A4**

- **Hydraulic Modeling of a Nature-Like Fishway using 2-Dimensional HEC-RAS**
  - Michael Hross, Kleinschmidt
  - Chris Goodell, Kleinschmidt

- **Refrotting Fish Passes at Dams and Weirs: International Best Practice, Knowledge Gaps, Current Research and Foreseeable Developments**
  - Marq Redeker, CDM Smith

- **Dam Decommissioning in Mississippi: Maintain It or Drain It**
  - Johnathan Atkins, MS DEQ

- **Dam Removal Allows Boardman River to Reclaim Natural Alignment**
  - Craig Seger, Contech Engineered Solutions
  - Dan Devaun, AECOM

- **Seismic Fragility Relationships for Embankment Dams from Empirical Performance Data**
  - Glenn Rix, Geosyntec Consultants, Inc.
  - Lynne Ewert, Georgia Institute of Technology

- **Design Details - Concrete Chute Spillways**
  - Paul Rizzo, RIZZO International, Inc.
  - Automated Crack Width Calculation
    - James Rutherford, Hatch
    - John Werner, Hatch
    - Iman Ghorbani, Hatch
    - Colleen Woods, Hatch

- **A Study on Seismic Effects of Gate-Wall Interaction on Spillway Gates in an Existing Spillway**
  - Anurag Singhal, HDR

- **A Numerical Study of the Effect of Hysteresis on Transient Seepage Flow**
  - Fred Tracy, Engineer Research and Development Center
  - Maureen Corcoran, Engineer Research and Development Center

- **Three-Dimensional Finite Element Analysis of Levee Through Seepage Considering End-Around Effects**
  - Joseph Weber, Loyola Marymount University

- **Impacting Engineering Judgement Using 3-Dimensional Data Management Techniques**
  - Nate Bolles, Black & Veatch
  - Andrew Higgins, Geosyntec
  - Rozh Moghadameen, Tennessee Valley Authority

- **Using Technology and Old-Fashioned Detective Work to Predict Low-Level Outlet Tunnel Performance under Catastrophic Loading**
  - Minnolus Kurka, Mead & Hunt
  - George Webb, Terracon

- **Roller Compacted Concrete Placed with a High Density Paver for Use as a Flood Barrier - Application to TVA Dam**
  - Husein Hasan, TVA
  - Quincy Anderson, Barnard Construction Company, Inc.
  - Aaron Nottis, TVA
Wednesday, April 10 — 1:30 pm - 3:30 pm
CONCURRENT SESSIONS — TRACK 4

4A: Concrete II
Room: Salon A2
Moderators: Eric Kennedy, Federal Energy Regulatory Commission; and Robert Hall, USACE
Concretes for Concrete Dams
Quentin Shaw, ARQ Consulting Engineers
Implementation of Bathymetric and LiDAR Surveys into Sliding Stability Assessment of Concrete Gravity Dams
Tank Saichi, Polytechnique Montreal
Sylvain Renaud, Polytechnique Montreal
Najib Bouaanani, Polytechnique Montreal
Benjamin Miquel, Hydro-Quebec
Fontana Dam Spillway Crack Investigation
Michael Morrison, Tennessee Valley Authority
James Rossilllon, Tennessee Valley Authority
Dan Curtis, Hatch Associates Consultants, Inc.
Performance-Based Assessment of Post-Tensioned Anchors in a Large Concrete Dam
Casey Gardner, Harvey Mudd College
Maggie Gelber, Harvey Mudd College
Andrew Pham, Harvey Mudd College
Dana Shangguan, Harvey Mudd College
Flora Xia, Harvey Mudd College
Ziyad Duron Robert Hall, Harvey Mudd College; Engineering Innovations, LLC
Application of Response Surface Meta-model in Probabilistic Analysis of Concrete Dams
Mohammad Amin Hariri-Ardabili, University of Colorado Boulder
Mohammad Noori, CalPoly S. Mahdi Seyed-Kolahd, X-Elastica LLC
Development of Seismic Thresholds in ShakeCat for FERC Post-Earthquake Notification, Inspection, and Damage Assessment
Chris Wang, Federal Energy Regulatory Commission
Edgar Salire, Federal Energy Regulatory Commission
Justin Smith, Federal Energy Regulatory Commission
Seismic Deformation of Different Size Embankments on a Spatially Variable Liquefiable Deposit
Nicholas Pauell, University of California Davis
Ross Boulanger, University of California Davis
Jason Dohng, University of California Davis
Use of Horizontal to Vertical (H/V) Ambient Noise Measurements to Determine Natural Frequency of Embankment Dams
Albert Kottke, Pacific Gas and Electric
Emily Steen, Pacific Gas and Electric
Lessons Learned from Re-Evaluation of the Upper and Lower San Fernando Dams Using Current State of Practice in Numerical Modeling
Khaleed Chowdhury, USACE
Raymond Seed, University of California, Berkeley
Vlad Perleg, AECOM
Michael Beatty, AECOM
Fenggang Ma, Kleinfelder
George Hu, USACE
Modulus Reduction and Damping Ratio of Compacted Earth Cores of Dams
Dong Soon Park, K-water
K-water Convergence Research Institute
Seong-Bae Jo, K-water Convergence Research Institute
Thornton Composite Reservoir – Limited Accessibility Leads to Challenging Instrumentation and Monitoring
Hannah Maas, Stantec
Rachael Bisnett, Stantec
Louis Storino, Metropolitan Water Reclamation District of Greater Chicago
Case Study: Automated Movement Monitoring with Grouped AMTS in Prairie Du Sac Dam
Rachel Victor, Sixense
Loic Gillis, Sixense Group
USA
Zhangwei Ning, Sixense Group
USA
Implementing an Instrumentation Monitoring Program for the Staged Construction of the Red Rock Hydroelectric Project
Thomas Andrews, Stantec
Rachael Bisnett, Stantec
Hannah Maas, Stantec
Chicago Sanitary and Ship Canal at Lockport Rehabilitation Case Study
Thomas Mack, USACE
Andrew Goodall, USACE
Design and Construction of the Norway Hydroelectric Project Spillway Capacity Expansion
Manohree Sundaram, Stantec
Jason Hedien, Stantec
Justin Darling, NIPSCO, LLC
Flood Model for the World-Record Rainfall from July 1942 Smethport, PA Storm – Supporting the Pennsylvania Probable Maximum Precipitation Study
Bill Kappel, Applied Weather Associates
Joe Bellini, Aterra Solutions
Inflow Design Flood Selection for Long Embankment Dams
Mike Gerlach, Stantec Consulting Services Inc.
Bob Eichinger, Stantec Consulting Services Inc.
Stochastic Framework for Flood Risk Analysis
Siamak Esfandiary, FEMA
Sean McNabb, FEMA
Andrew Bonner, AECOM
Mathew Mampara, Dewberry
A Holistic Evaluation of Potential Downstream Indundation for the Baker River Hydroelectric Project
Loring Crowley, Schnabel Engineering
Ali Tabrizi, Schnabel Engineering
Kevin Ruswick, Schnabel Engineering
Joshua Gile, Puget Sound Energy
Alex Rutledge, Schnabel Engineering
Dam and Levee Break Modeling with HEC-RAS Simulation and Risk Analysis (SimRAS)
Brent Travis, WEST Consultants, Inc.
Chris Bahner, WEST Consultants, Inc.
Gyan Basyal, WEST Consultants, Inc.
Brian Wahlin, WEST Consultants

4B: Earthquakes (Embankments)
Room: Salon A4
Moderators: Zahra Amini, Room: Salon A4
Convergence Research Institute
Dasgupta, Southwest Moderator: Melinda Dirdal, Room: Salon A3
Consultants, Inc.
Theme III
Moderators: Melinda Dirdal, Room: Salon A5
Consultants, Inc.
4C: Conference Theme III
Room: Salon A1
Moderators: Brandon Vavrek, Seattle City Light; and Travis Totka, USACE
4D: H&H (Hydrology)
Room: Salon A3
Moderators: Melinda Dirdal, Room: Salon A5
Consultants, Inc.
A Dam Innovative Solution: Cutoff Walls and Pressure Grouting at Georgia’s Richland Creek Dam
Eloy Ramos, Nicholson Construction
Craig Robinson, Piedmont Geotechnical Consultants
Brian Barkauskas, Nicholson Construction
Raphael Delihaye, Nicholson Construction
Lessons Learned from More Than 35 Years of Cofferdam Construction
Treating Excessive Seepage at a Dam Site in the Lower Himalayas
Joseph Kovacich, Stantec
Hafiz M. Kashif Bajwa, National Engineering Services Pakistan (NESPAK)
Practical Application of Seepage Analyses for Rehabilitation of Existing Dams and Levees
Lucas Carr, Geosyntec Consultants
Tom Cooling, AECOM
G. Richard Bird, AECOM
Scott Morgan, AECOM
Using Piezometer Data to Better Understand the Rehabilitation Performance of the C.W. “Bill” Young Regional Reservoir
Jason Valeria, Gannett Fleming, Inc.
Scott Burch, Gannett Fleming, Inc.
Hazard Potential Classification within Levee Safety Programs
Jasmine Austin, U.S. Army Corps of Engineers
Rick Hauck, U.S. Army Corps of Engineers

The Lower Wood River Levee Risk Informed Formulation Case History
Chris Redell, USACE

Intermittent Embankment Overtopping: Erosion Protection Options
Bryan Scholl, Watershed Geo
Brad Cooley, Watershed Geo

Levee Remediation Alternatives Analysis of a Partially Failed Rio Grande Levee in Brownsville, TX

Improving Levee Resiliency - Mitigating Failure Modes to Avoid Disasters in Great Britain and the United States
Robert Beduhn, HDR Engineering Inc.
Jonathan Simm, HR Wallingford

Case History on Monitoring Seepage on Large Zoned Embankment Dams
Thomas Solano, ISAGEN S.A. E.S.P.
Rafael Prieto, Gannett Fleming, Inc.

Phased Approach in Evaluating Existing Piezometers to Inform a Risk Assessment, Blakely Mountain Dam, Ouachita River, Arkansas
Suzanne Hess-Brittelle, USACE
Amy LeFebvre, UUSACE
Ryan Reves, USACE
Tracy Phillips, USACE

Jerry F Costello Lock and Dam Unwatering Monitoring
Lucas Krumwiede, USACE
Amanda Sutter, USACE
Sean Hibbits, USACE
Keith Thole, USACE
Samuel Ross, USACE

How Old is Too Old? Deciding When to Upgrade or Replace the Equipment in Automated Data Acquisition Systems
Daryl Jordan, Oglethorpe Power Corporation
Tim Newton, Canary Systems, Inc.
Greg Dutson, Canary Systems, Inc.
Darren Olguin, Canary Systems, Inc.
Martin Hieronymi, Brookfield Renewable
Carol Leung, Los Angeles County Public Works

Applications of Underwater Acoustic Remote Sensing
Kenneth LaBry, Underwater Acoustics International, a Division of Fenstermaker

Use of Risk Assessment Information to Inform Design of Dams and Levees
Michael Sharp, U.S. Army Corps of Engineers
Elena Sossenkina, HDR, Inc.
Noah Vroman, U.S. Army Corps of Engineers

Managing Risk During Major Earth Fill Dam Seismic Retrofit Project
Scott Huntsman, Black & Veatch
Megan Purcke, Black & Veatch

How a Little Seepage and Minor Spillway Slab Displacement Led to Reservoir Restrictions and Remediation
Becky Allen, Kleinschmidt Associates
Keenan Goslin, Kleinschmidt Associates
Wade Osborne, Cornforth Consultants
Jeff Coffin, Kleinschmidt Associates

Simulating Spillway Gate Availability in Dam Safety Risk Studies
Gregory Baecher, University of Maryland
Robert Patev, US Army Corps of Engineers
Adiel Komey, University of Maryland

Trees on Dikes - Flood Protection Versus Ecological Landscape Planning?
Aloys Kisse, CDM Smith Consult Gmbh, Bochum, Germany

The conference closing party will take place at the indoor one-acre botanical garden at historic Navy Pier. Event ticket is included with all full conference and guest registration fees.

This six-story glass atrium with a 50-foot arched ceiling holds over 80 live palm trees, lush foliage, and fountains.

Wander through the one-acre indoor tropical garden while enjoying various Chicago-themed foods and drink. Don’t forget to take your selfie in the special photo booth to capture the moment. Surprise entertainment throughout the gardens promises to make this closing party the talk of the town.

Transportation will be provided at the Chicago Hilton to and from the Crystal Garden.