

# SGMA CONFERENCE

## TOOLS FOR DEVELOPING A GSP



A critical step for compliance with the Sustainable Groundwater Management Act (SGMA) is the development of a successful Groundwater Sustainability Plan (GSP). This conference focuses on tools and techniques that can support key elements and programmatic considerations for GSP development.

**MAY 3 - 4, 2017**

DoubleTree by Hilton Hotel Modesto  
1150 Ninth Street Modesto, CA 95254

### AGENDA



**Groundwater  
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# Welcome to GRA's SGMA Planning-themed Conference!

The Groundwater Resources Association of California (GRA) welcomes you to our Conference on Tools for Developing a GSP! Over the next two days we are featuring a slate of highly regarded speakers that will take us on a journey into subjects that will broaden our knowledge of this new groundwater management paradigm called groundwater sustainability planning.

The Sustainable Groundwater Management Act (SGMA) went into effect on January 1, 2015. In a little over two years, much has happened to meet the requirements of SGMA:

- Groundwater basins subject to critical overdraft were identified
- Regulations were adopted to revise groundwater basin boundaries, and a round of basin boundary modifications was conducted by DWR
- Adjudicated basin reporting to DWR was started
- Regulations were adopted for evaluating and implementing Groundwater Sustainability Plans (GSPs), coordination agreements, and alternatives to GSPs
- A draft report on *Water Available for Groundwater Replenishment* was released by DWR
- Bulletin 118 Interim Update 2016 was released
- The first round of SGMA best management practices was released

June 30, 2017 marks the deadline for Groundwater Sustainability Agencies (GSAs) to be formed in all high and medium priority groundwater basins. This date also represents an unofficial transition to what may be the most important element of SGMA: preparation of GSPs for the purpose of monitoring these priority basins, identifying undesirable conditions within the basins, taking steps to mitigate these undesirable conditions, and presenting comprehensive management strategies designed such that the basins will be sustainably managed within twenty years. GSPs for basins with conditions of critical overdraft are due in 2020, while GSPs for all other high and medium priority basins are due in 2022. Over the next 3 to 5 years, GSAs will be devoting significant efforts to prepare their GSPs.

This conference will provide information and tools that will help GSAs, consultants, other involved agencies prepare and implement effective GSPs. The conference is focused on four key areas of GSP development that are generating much interest:

1. Stream Depletion and Groundwater Dependent Ecosystems
2. Groundwater Data and Modeling / Setting Measurable Objectives
3. Best Management Practices for Sustainable Management of Groundwater Basins
4. Water Available for Groundwater Replenishment

In addition, we will have a Day 2 closing panel session that will take a look at the resources that are available to help with groundwater sustainability planning.

We are also pleased to present Bill Alley of the National Groundwater Association as our Keynote Speaker. John Diodati of the San Luis Obispo County Department of Public Works will be our Day 1 lunchtime speaker. Concluding our Day 1 speaker sessions, we will have our President's Reception and Poster Session, followed by a special meeting of GRA's San Joaquin Valley Branch, which all are invited to attend.

Please also take the opportunity to visit the exhibitors who help make events like this possible. We appreciate the work they do with groundwater practitioners to help advance the science.

We hope you enjoy this conference!

Sincerely,

## The Conference Planning Committee

Brett Wyckoff, Chair	Tom McCarthy	Sarah Kline
John Lambie, Co-chair	Lisa Porta	Christie Kennedy
Jim Strandberg, Co-chair	Ryan Alward	Tim Parker
Anona Dutton	Chris Petersen	Steve Phillips



# FULL CONFERENCE AGENDA



## Wednesday May 3, 2017

7:00am Registration/Continental Breakfast  
8:15am Conference Welcome  
*GRA President, Chris Petersen, GEI and Conference Chair, Brett Wyckoff, Department of Water Resources*

8:30am - 9:30am Lessons for SGMA Plans from around the World  
*Bill Alley, National Ground Water Association*  
9:30am - 9:40am Meet the Sponsors & Exhibitors  
9:40am - 10:00am Break In the Exhibit Area

### Session 1 - Stream Depletion and GDEs

*Moderator: John Lambie, E-PUR*

10:00am - 10:25am Streamlining Stream Depletion Modeling for Analysis of Groundwater Management Actions: An Interactive Approach for Managers and Stakeholders  
*Deborah Hathaway, S.S. Papadopoulos & Associates, Inc.*

10:25am - 10:50am Tools for Developing Groundwater Elevation Proxies for Surface Water Depletion Rates  
*Derrick Williams, HydroMetrics Water Resources, Inc.*

10:50am - 11:15am Comparison of Surface-Groundwater Interaction Model Approaches to Establish Surface Water Protection Zones in Stanislaus County  
*Bob Abrams, Jacobson James & Associates*

11:15am - 11:40am Geochemical and Isotopic Tracers of Surface Water-Groundwater Interaction  
*Dr. Jean Moran, California State University, East Bay*

11:40am - 12:05pm CEQA as a Groundwater Management Framework for Protecting Groundwater Dependent Ecosystems  
*Bob Harrington, Inyo County Water Department*

12:05pm - 1:30pm **Options and Risks to Consider for Funding SGMA**  
*John Diodati, San Luis Obispo County Public Works Department*

### Session 2 - Groundwater Data & Modeling / Setting Measurable Objectives

*Moderator: Anona Dutton, Erler & Kalinowski, Inc.*

1:30pm - 1:55pm Minimum Thresholds, MODFLOW, and Sustainable Yield—Example of Model Application in a Coastal Groundwater Basin  
*John Lindquist, United Water Conservation District*

1:55pm - 2:20pm Using Cross-Sectional Models to Develop Proxy Measurable Thresholds for Seawater Intrusion  
*Sean Culkin, HydroMetrics Water Resources, Inc.*

2:20pm - 2:45pm Land Subsidence Monitoring and Quantitative Assessment Tools for Groundwater Sustainability Plans  
*Michelle Sneed, California Water Science Center, U.S. Geological Survey*

2:45pm - 3:10pm Stanislaus County Groundwater Ordinance and Discretionary Well Permitting: Lessons Learned and Tools for Sustainable Groundwater Management  
*Mike Tietze, Jacobson James & Associates, Inc.*

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3:10pm - 3:30pm	Break In the Exhibit Area
<b>Session 3 - Groundwater Data &amp; Modeling / Setting Measurable Objectives (continued)</b>	
<i>Moderator: Steven Phillips, United States Geological Survey</i>	
3:30pm - 3:55pm	Use of MODFLOW 6 to Simulate Demand-Based Boundary Flows <i>Joseph D. Hughes, U.S. Geological Survey</i>
3:55pm - 4:20pm	IWFM and C2VSim: Two Modeling Tools to Aid GSAs Comply with SGMA Requirements <i>Emin Dogrul, California Department of Water Resources</i>
4:20pm - 4:45pm	Progressive Development of Decision Support Tools and Groundwater Models for Groundwater Sustainability Plans <i>Enrique Lopezcalva, RMC, a Woodard &amp; Curran Company</i>
4:45pm - 5:10pm	California Statewide Agricultural Land Use Mapping for Informed Decision Making and Temporal Change Assessment <i>Dr. Joel Kimmelshue, Land IQ</i>
5:10pm - 7:15pm	President's Reception & Poster Session
7:00pm - 9:00pm	San Joaquin Valley Branch Meeting: Agribusiness Response to SGMA <i>Richard M. Moss - Principal, New Current Water and Land LLC</i>

## Thursday May 4, 2017

7:00am	Continental Breakfast
8:15am	Day 2 Conference Welcome <i>Conference Chair, Brett Wyckoff, Department of Water Resources</i>

### Session 4 – Best Management Practices for Sustainable Management of Groundwater Basins

*Moderator: Lisa Porta, CH2M*

8:30am - 8:55am	The Right Tools for the Job: Case Studies to Inform Groundwater Management in California <i>Christina Babbitt, Environmental Defense Fund</i>
8:55am - 9:20am	Water Budget Framework for California <i>Todd Hillaire, Department of Water Resources</i>
9:20am - 9:45am	Addressing Hydrogeologic Conceptual Model Uncertainty within the SGMA Planning Framework <i>Abhishek Singh, INTERA Incorporated</i>
9:45am - 10:20am	Break In the Exhibit Area

### Session 5 - Best Management Practices for Sustainable Management of Groundwater Basins (Continued)

*Moderator: Brett Wyckoff, Department of Water Resources*

10:20am - 10:45am	Technical Consensus and Multi-Party Sustainability Planning, Westside Groundwater Basin <i>John Fio, HydroFocus, Inc.</i>
10:45am - 11:10am	Groundwater Sequence Stratigraphy: A Geology-based Approach for Developing Accurate and Representative Hydrogeologic Conceptual Models for Successful Groundwater Sustainability Plans <i>Rick Cramer, Burns &amp; McDonnell</i>
11:10am-11:35am	The Multiple Roles for Environmental Data in the SGMA <i>John Lambie, E-PUR</i>
11:35am - 12:00pm	California Actual Evapotranspiration (CalETa) Mapping Program: A Critical Input for Ground Water Modeling <i>George Paul, Formation Environmental, LLC</i>
12:00pm - 1:30pm	Lunch

continued..



## Session 6 – Water Available for Groundwater Replenishment

Moderator: Christy Kennedy, RMC, a Woodard & Curran Company

- 1:30 pm - 1:55pm Stormwater Resource Plan Development and the Sustainable Groundwater Management Act  
*Adam Questad and Maygan Cline, Geosyntec Consultants*
- 1:55pm - 2:20pm Stormwater Runoff from Urbanized Areas as a Groundwater Recharge Source  
*Michael Milczarek, GeoSystems Analysis, Inc.*
- 2:20pm - 2:45pm Groundwater Recharge Feasibility Assessment for Sustainable Groundwater Management  
*Timothy Leo, Montgomery & Associates*
- 2:45pm - 3:10pm Quantifying the Effect of Groundwater Replenishment Under Changing Climate Scenarios  
*Jill Weinberger, Dudek*
- 3:10pm - 3:30pm Break In the Exhibit Area

## Closing Panel Session – What Resources are Available to Help with Groundwater Sustainability Planning?

- 3:30pm Panel Introduction  
*Moderator: Jim Strandberg, West Yost Associates*
- 3:35pm - 3:45pm Amy Woodrow - Water Resources Hydrologist, Monterey County Water Resources Agency
- 3:45pm - 3:55pm Jack Rice - Associate Counsel, California Farm Bureau Federation
- 3:55pm - 4:05pm Dane Mathis - Supervising Engineering Geologist, Division of Integrated Regional Water Management, Department of Water Resources
- 4:05pm - 4:15pm Sam Boland-Brien - Chief, Groundwater Management Program, State Water Resources Control Board
- 4:15pm - 4:25pm Steve Phillips - Hydrologist, U.S. Geological Survey
- 4:25pm - 4:35pm Tara Moran - Program Lead, Sustainable Groundwater, Stanford Water in the West
- 4:35pm - 5:00pm Panel Discussion/Q&A



# Poster Presentations

Bob Anderson, Geosyntec Consultants

## **Groundwater Planning in the Columbia Basin – Lessons for California’s Success**

Joan Blainey, INTERA Incorporated

## **Estimating Water Budgets and Quantifying Uncertainty in Estimates**

Anthony Daus, GSI Environmental, Inc.

## **Integrating NEXRAD and Rain Gauge Data to Build Better Precipitation Estimates**

Nicole Gotberg, Geosyntec Consultants

## **Hydrogeologic Limitations to Artificial Recharge: Castaic Case Study**

Deborah Hathaway, S.S. Papadopoulos & Associates

## **Modeling Effects of Flow Alteration on Groundwater Dependent Ecosystems**

Randall Holmes, Stanford University

## **The Role of Free Chlorine in Trace Metal Mobilization During Managed Aquifer Recharge**

Melody Kneale, Aquilogic

## **Data Management Tools for GSA’s**

John Kramer, Condor Earth

## **Management Areas within Groundwater Basins and Hydrogeologic Conceptual Models**

Karen LeFebvre, Department of Fish and Wildlife

## **California Department of Fish and Wildlife: Observations and Lessons Learned while Compiling an Inventory of Groundwater Wells on Department Lands**

Bwalya Malama, California Polytechnic State University

## **The Stream Depletion Paradox: Depletion without Stream Drawdown**

Sandi Matsumoto, The Nature Conservancy

## **Mapping and Managing Groundwater Dependent Ecosystems: Tools for SGMA Groundwater Sustainability Plans**

Kate Richards, GSI Environmental, Inc.

## **MODFLOW-USG: Recent Add-ons that Expand Applications**

Jacob Scherberg, GeoSystems Analysis

## **IWFM as a Tool to Model Water Resource Management Alternatives to Optimize Agriculture Use and Endangered Species Habitat Improvement**

Abhishek Singh, INTERA Incorporated

## **Using the Adjoint Method to Efficiently Calculate Impact of Groundwater Pumping on Surface-water Flows**

Raghavendra Suribhatla, INTERA Incorporated

## **Integrating Precipitation Datasets from Global Climate Models into C2VSim to Assess the Impact of Climate Change on Basin-scale Groundwater Budgets**

Mark Ziman, Water Sage

## **The CA Groundwater Data Landscape**



# Sponsors & Exhibitors

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**DUDEK** Jill Weinberger, Senior Hydrogeologist  
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Dudek has provided environmental, engineering and hydrogeological services to California municipalities, water and wastewater agencies, special districts, and private landowners since 1980. We are a California-focused firm with more than 400 professionals and technical staff in 11 offices throughout the state. For more information contact us at 800-450-1818 or at info@dudek.com

**GEI Consultants, Inc.**  
**GEI** Chris Petersen, Principal Hydrogeologist  
2868 Prospect Park Drive Suite 400  
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GEI Consultants, Inc. brings to our clients a refreshing blend of technical expertise, collaborative spirit and innovation that is rare in our profession. We are a trusted source of technical expertise to hundreds of clients nationwide who value high quality service and work products, and who seek a strong partner to achieve their desired project outcomes. Founded in 1970, we have completed more than 35,000 projects in all 50 states and 25 countries.

**GSI Environmental Inc.**  
**GSI** Anthony Daus  
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949-679-1070 add@gsienv.com

GSI Environmental Inc. (GSI) is an engineering and science consulting firm providing innovative and effective solutions to environmental and water resources issues worldwide for over 30 years. GSI's team of engineers, geologists, and hydrogeologists provide a wide range of specialized services for complex water resource studies, groundwater modeling evaluations, climate change impact analyses, integrated surface-water/groundwater assessments, basin evaluations, water supply reliability and optimization, environmental contamination and remediation management, and associated litigation support. We have worked with industry and government clients as well as regulatory agencies in the US and overseas. GSI fosters development of strong listening and communication skills to fully understand project needs and stakeholder concerns to provide efficient, timely and focused results and develop credible professional relationships with clients, regulators and interested parties. We also have a strong culture of teaming with academia, research organizations and other consulting firms so as to provide the best team for our clients.

**Land IQ**  
**LAND IQ** Joel Kimmelshue, Owner/Principal Soil & Agriculture Scientist  
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Land IQ specializes in providing solutions to challenging agricultural and environmental problems throughout the world. Our areas of expertise include general agricultural sciences, soil science, crop water use, agricultural water balances, water quality and demand evaluation and management, agricultural systems, salinity and nutrient management, ecosystem restoration, statistics, remote sensing, geospatial analysis, land stabilization, and regulatory policy. Land IQ maintains a staff of soil scientists, agronomists, ecologists, as well as highly technical remote sensing and GIS trained experts. Our work efforts commonly span large landscapes and focus on land use change as the basis for overall interpretation and application of results. We have offices in Sacramento, Los Angeles and Twin Falls, ID.

**Yellow Jacket Drilling Services**  
**YELLOW JACKET** Erik Gaiser, Business Development  
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Yellow Jacket Drilling (YJD) has built a reputation throughout the Western US as a premier provider of high quality and innovative drilling solutions that are both safe, and cost effective. YJD specializes in, but is not limited to, providing drilling services for the environmental, geotechnical, mining, water supply, and energy market sectors. YJD's experienced staff partners with our clients to tailor a drilling and/or sampling program to meet their project specific objectives. Our



diverse fleet of late model drilling and well service equipment lets us apply the best available technology to any site conditions so you can reach your goals.

## Lunch Sponsor

### **INTERA Incorporated**



David Jordan, Vice President & Principal Water Resources Engineer  
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INTERA is a geosciences and engineering consulting firm with over four decades of experience in providing solutions to water resource and environmental challenges. INTERA's primary water resources services include water resource planning, groundwater availability assessments, three-dimensional geologic and hydrogeologic visualizations, GIS and database applications, and remote sensing. A leader in the development and application of conceptual and numerical models and other quantitative decision support tools, INTERA specializes in using proven hydrologic, hydraulic, hydrodynamic, and water quality models to deliver scientifically sound, cost-effective, and reliable solutions for our clients.

Reception Sponsor



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Leslie Dumas, Senior Water Resources Engineer  
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RMC, A Woodard & Curran Company, is an environmental engineering company focused exclusively on water. Over the past two decades, RMC has become an industry leader in groundwater studies and evaluations, integrated groundwater and surface water modeling, integrated regional water management, data management, water recycling, and strategic planning. Our professionals have been actively involved in the development of Groundwater Management Plans since the passage of the Groundwater Management Act in 1992, and we are currently working with agencies around the state to comply with new guidelines created by the passage of the Sustainable Groundwater Management Act (SGMA) in 2014. We have worked with many local and regional agencies throughout California—as well as the Department of Water Resources (DWR), and State Water Resources Control Board (SWRCB)—on groundwater related projects. Through this work and our industry involvement, RMC has helped California agencies move toward sustainable groundwater management.

## Reception Bar Sponsor



### **Daniel B. Stephens & Associates, Inc.**

Nicole Sweetland, Principal Hydrogeologist  
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Daniel B. Stephens & Associates, Inc. (DBS&A) is a full-service groundwater science and engineering consulting firm with particular expertise in hydrogeologic investigations; water resources planning and development; water rights; studies of contaminant transport in soil and groundwater; numerical modeling; remediation of soil and groundwater; custom solutions for data management and mapping; and technical support for environmental and water resource disputes. As an affiliate of Geo-Logic Associates, Inc., an employee-owned company, DBS&A has access to 250 professionals and 27 offices in the U.S. and abroad, including 11 offices in California.



## Member Exhibitors

### ASC Tech Services



Eric Garcia, Principal Hydrogeologist  
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925-756-1210 ericgarcia@questgsm.com

ASC Tech Services (ASC) is a professional environmental field services company founded in 1996 by a Geologist with over 25 years of environmental consulting experience. ASC specializes in the implementation of High-Resolution Site Characterization (HRSC) technologies to assist consultants and clients in the understanding of subsurface lithology/hydrogeology and/or contaminant distribution in real-time. ASC can acquire HRSC data to determine lithologic/hydrogeologic changes and track contaminants by taking a snapshot of the subsurface with minimal disturbance of the subsurface and without generating soil or groundwater wastes. With innovative HRSC technologies, ASC can assist consultants and clients to evaluate a site in one visit, allowing the infield professionals to make real-time decisions. Our services are provided with geoscientists in the field in order to assist consultant and client personnel in the interpretation of HRSC data.

### Blaine Tech Services



Francis Thie, Vice President  
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408-573-0555 fthie@blainetech.com

Blaine Tech Services (WBE/WOSB) is a specialty contractor that focuses exclusively on groundwater sampling and related field services. Our trained technicians operate custom, purpose-built vehicles and can safely and efficiently execute the most complex field sampling procedures on the most challenging sites. Groundwater sampling services include Traditional Purging & Sampling, Low Flow Sampling, Westbay System sampling, Barcad wells, PDBs, HydraSleeves, CMTs and Deep Well Sampling (1,000' + bgs). Other services include Surface Water Sampling, Soil Vapor Sampling, Soil Sampling, Well Development, Pump Test Support and Wellhead Repair & Maintenance. Five offices in California and Washington serve the West Coast and beyond.

### Confluence Environmental



Megan Kerns, President  
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Confluence Environmental is a field services provider committed to providing the highest level of sampling and technical field services at competitive prices. With our extensive experience we offer a broad range of expertise to keep jobs running safely, smoothly, and efficiently. Complicated and challenging sites with specific intensive protocol are our specialty.

### Daniel B. Stephens & Associates, Inc.



Michael Yacyshyn, Principal Engineer, Northern California Regional Manager  
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DBS&A's water resource professionals have expertise in groundwater science and planning and support communities with elements of all five Department of Water Resources' SGMA BMP categories:

- Monitoring Protocols, Standards, and Sites
- Monitoring Networks and Identification of Data Gaps
- Hydrogeologic Conceptual Modeling
- Water Budget Development
- Groundwater and Surface Water Modeling

DBS&A is currently preparing the groundwater budgets for four groundwater basins for the Fox Canyon Groundwater Management Agency's Groundwater Sustainability Plan—the first water balances completed under SGMA—implementing a distributed parameter watershed model developed by our modelers to address hydrologic data limitations by estimating key components of the groundwater/surface water balance.





### **GeoSystems Analysis, Inc.**

Michael Milczarek, Program Director  
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520-405-3828 [mike@gsanalysis.com](mailto:mike@gsanalysis.com)

GeoSystems Analysis, Inc. (GSA) has pioneered innovative solutions in groundwater recharge since 1996 and has conducted over 30 artificial groundwater recharge feasibility investigations in California and other western states with over 500,000 acre feet of total storage per year successfully permitted. We specialize in the design and implementation of innovative vadose zone and groundwater characterization and monitoring methods that eliminate the need for pilot project studies. GSA also has significant experience on the development of stormwater capture and groundwater recharge projects and extensively used IWM to optimize conjunctive use to support agriculture and municipal water use, and endangered species via groundwater recharge.

## **Non-Member Exhibitors**

### **Formation Environmental**



Mark Roberson, Hydrologist  
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Formation Environmental, LLC (Formation) is at the forefront of developing state-of-art solutions to efficiently attain each client's technical, regulatory, and financial objectives. Our team of highly qualified and motivated scientist and engineers develop innovative tools and analysis techniques to support clients in environmental, agricultural and water resources sector.

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Leggette, Brashears & Graham, Inc. (LBG) is a multidisciplinary environmental consulting firm dedicated to serving public water suppliers, industrial water users, and government agencies. We provide expert geophysical and modeling services to locate and manage groundwater. Since our founding in 1944, LBG has focused solely in the fields of hydrogeology and environmental engineering.

### **Ponderosa Advisors**



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Water Sage is the largest integrated water and land information platform in the country. We connect thousands of users to water rights, groundwater, streamflow, and land information in an intuitive, map-based research system. Water Sage makes deep knowledge accessible to the full spectrum of water stakeholders, from empowering basic research to enhancing professional workflows.

### **Wildermuth Environmental**



Mark Wildermuth, President  
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Wildermuth Environmental, Inc. (WEI) is a specialized water resources consulting firm, dedicated to creating innovative and practical solutions to the complex water problems facing California water agencies. We believe in challenging the status quo by clearly identifying the impediments our clients face in achieving their water resource management goals and defining creative approaches to eliminating those impediments. We invent new approaches that replace status quo processes through listening, exhaustive research, data assembly, and analytics; by creating powerful and elegant decision support tools; by assisting our clients in the implementation of solutions; and by building features into those solutions that provide for learning and future adaptation.



# Speaker Bios

## Bill Alley

William "Bill" Alley, Ph.D., is science and technology director for the National Ground Water Association (NGWA) and co-author with Rosemarie Alley of the book, "High and Dry: Meeting the Challenges of the World's Growing Dependence on Groundwater." Previous to his NGWA position, he served as chief of the Office of Groundwater at the U.S. Geological Survey for almost two decades. Dr. Alley has published over 100 scientific publications and received a number of awards, including the Meritorious Presidential Rank Award. He is a Fellow of the Geological Society of America.

## Deborah Hathaway

Ms. Hathaway is a hydrologist with expertise in regional water planning, groundwater model development, groundwater-surface water interactions, groundwater sustainability evaluations, and groundwater water quality. Ms. Hathaway, Vice-President of S.S. Papadopoulos & Associates, Inc., opened the Western office of S.S. Papadopoulos & Associates in 1994.

## Derrick Williams

Derrick Williams is President of HydroMetrics WRI, with over 29 years of experience in applied hydrogeology. He has developed management plans and models for groundwater basins throughout California. Mr. Williams helped develop ACWA's Groundwater Framework, and was the primary author of ACWA's Guidelines for Groundwater Monitoring. Mr. Williams currently chairs ACWA's Groundwater Best Management Practices subcommittee.

## Bob Abrams

Robert H. Abrams, PhD, PG, CHG, Jacobson James & Associates. Dr. Abrams earned his PhD in hydrogeology from Stanford University in 1999, and has over 15 years of experience in the quantitative analysis of groundwater and vadose zone systems. He has addressed issues of water supply development, groundwater sustainability, enhanced recharge and aquifer storage, water quality, and agrochemical impacts for projects throughout California. He is currently developing a regional groundwater flow model for the Stanislaus County area.

## Jean Moran

Dr. Jean Moran is Professor and Chair of the Department of Earth and Environmental Sciences at California State University East Bay. Her research focuses on using naturally-occurring and introduced isotopes to examine geochemical and transport processes in the vadose zone and in groundwater. Dr. Moran has a Ph.D. in Geochemistry from the University of Rochester. She has been an author on more than 60 peer-reviewed publications and was a Groundwater Resources Association of California Board Member from 2006-2011.

## Bob Harrington

Bob Harrington is the Director of the Inyo County Water Department. He has degrees in geophysics, hydrology/hydrogeology, and hydrology from the University of Nevada-Reno and the University of Arizona. He has been with Inyo County for 19 years, primarily concerned with the City of Los Angeles's water management activities in Owens Valley.

## John Diodati

John Diodati is a Deputy Director with the County of San Luis Obispo Public Works Department. He has worked on numerous Prop 218 initiatives, ranging from small rate increases to large multi-million dollar infrastructure projects. John is a native of California, who enjoys surfing and mountain biking in his spare time.

## John Lindquist

John Lindquist is a Senior Hydrogeologist at United, with an MS degree in Geosciences from the University of Arizona. John's current work at United is largely focused on planning for implementation of SGMA and potential recharge of recycled water.

## Sean Culkin

Sean is a senior hydrogeologist at HydroMetrics Water Resources in Oakland where he works on groundwater modeling and management projects. He is a registered hydrogeologist who has been practicing in California for over nine years.

## Michelle Sneed

Michelle Sneed is a hydrologist with the U.S. Geological Survey. Her research focuses on land subsidence related to fluid-pressure changes. She is a member of the UNESCO Working Group on Land Subsidence, the recognized leader in promoting global land subsidence studies. Michelle received BS and MS degrees in geology from CSU, Sacramento.

## Mike Tietze

Mike Tietze, PG, CEG, CHG, Jacobson James & Associates, Inc. Mr. Tietze has 30 years of experience managing groundwater resources, permitting and environmental projects throughout California and the western US and currently manages JJ&A's water resources practice. His work has focused on groundwater resources impact assessments under CEQA and NEPA, planning studies, and water supply investigations, especially for municipalities and energy clients.

## Joseph Hughes

Joseph Hughes is a hydrologist in the U.S. Geological Survey Office of Groundwater in Reston, Virginia. He is a member of the Modeling



Applications and Support Group and is currently working on MODFLOW related software development projects. He is also the author of the finite element, multi-species, density-dependent groundwater flow and transport code SUTRA-MS and the Surface-Water Routing (SWR) Process for MODFLOW-2005 and a co-author of the Seawater Intrusion Package (SWI2) for MODFLOW-2005, and MODFLOW-NWT.

### **Emin Dogrul**

Emin Can Dogrul received his B.Sc. degree in Civil Engineering from the Middle East Technical University in Turkey. He received his M.S. degree in 1996 and Ph.D. in 2000 from the Department of Civil and Environmental Engineering in University of California at Davis with an emphasis on water resources modeling. Since his graduation, he has been working for the California Department of Water Resources. He has been developing the Integrated Water Flow Model (IWFM) and IWFM Demand Calculator (IDC), and providing training and technical support to the water community on the use of these modeling tools. He is the 2003 recipient of the Hugo B. Fischer award given by the California Water and Environmental Modeling Forum (CWEMF).

### **Enrique Lopezcalva**

Enrique has 20 years of experience in the water industry, in the US and internationally, on water resources systems analysis and planning; systems modeling; climate change adaptation; sustainability and decision-support. Enrique has extensive experience in water supply and water resources planning, including groundwater planning and management.

Enrique is the Water Resources Practice Leader and a Vice President with RMC, a Woodard & Curran company. He holds a BS in Oceanography and has two master's degrees in Environmental Engineering and Environmental Policy from MIT.

### **Joel Kimmelshue**

Dr. Kimmelshue is a founding partner and Principal Soil and Agricultural Scientist with Land IQ. He holds a Ph.D. in Soil Science with a concentration in Water Resources from North Carolina State University in addition to his Certification as a Professional Soil Scientist (CPSS). He has worked in the field of soil science and agronomy for over 21 years. His extensive consulting experience includes practical and applied solutions for development and management of agricultural-based soil/water/plant systems; especially irrigated systems. This technical expertise also includes water resources science and planning, land reclamation, soil/plant nutrient dynamics and management, irrigation and drainage in arid and humid climates, soil classification, crop production, land application of municipal and agricultural wastes, water rights evaluations, vegetative and non-vegetative erosion control, and revegetation reclamation efforts. He is experienced in multi-stakeholder settings and works closely with owners as well as regulatory, agency, and consulting teams to develop workable and cost-effective approaches. Dr. Kimmelshue also has first-hand production agriculture experience from growing up and working on a diversified tree and row crop farming operation in northern California. He still maintains an ownership and management interest in the family farming operation.

### **Christina Babbitt**

Christina is a manager in the California Groundwater Program at EDF, where she is working with her team to launch replicable groundwater sustainability pilot projects across California's Central Valley. In these efforts, Christina works to build partnerships in the agricultural community, foster collaboration among NGOs, agencies, water districts, and agricultural partners, and contributes technical expertise on water governance structure and design.

Christina's past research has focused on sustainable water resources management in stressed watersheds within the western U.S., Europe, and eastern Africa. Prior to joining EDF, Christina worked as a senior associate at Blue Earth Consultants, LLC in Oakland, California, where she specialized in natural resource management, institutional design and effectiveness, and strategic planning. Previously, Christina held positions with the National Oceanic and Atmospheric Administration Coastal Services Center in Oakland, California, and the U.S. Environmental Protection Agency's Office of Water in Washington, D.C.

Christina holds a Ph.D. in Natural Resources from the University of Nebraska - Lincoln; a M.Sc. in Environmental Science and Graduate Certificate in Geographic Information Systems from Florida International University; and B.A. in International Relations from Rollins College.

### **Todd Hillaire**

Todd Hillaire is a Senior Water Resources Engineer with the California Department of Water Resources' Northern Region Office in Red Bluff. He has a BS Degree in Civil Engineering from CSU, Chico. His experience includes implementing water budget and water use methodologies and crop modeling for the California Water Plan Update along with providing technical support on Sacramento Valley operations for DWR's CalSim III development. With over 25 years of experience, his assignments have included stream gaging, six Water Plan Updates, California's Groundwater (Bulletin 118), land use and water supply infrastructure mapping, water resource investigations, stream and meadow restoration, floodplain mapping, and flood control project analysis.

### **Abhishek Singh**

Dr. Abhishek Singh has over 15 years of research and consulting experience in the areas of water resources planning and management, hydrologic modeling (surface water and groundwater), risk and uncertainty analyses, optimization techniques, geographic information systems (GIS), and data analytics. He has applied his expertise on projects across the United States involving modeling of complex hydrogeologic systems, assessment of the impact of climate change on water planning; modeling to support permitting, licensing, and compliance for radioactive waste disposal facilities; and optimization of groundwater remediation and monitoring design. Dr. Singh is experienced in developing integrated GIS and geodatabases in support of water resource projects. As INTERA's Manager of California Operations, Dr. Singh oversees water resources projects for a number of Southern California water agencies and water purveyors to address issues that include understanding and modeling complex hydrogeologic systems and surface-water/groundwater interactions,



estimating basin-wide water budgets, addressing seawater intrusion, modeling contaminant plume migration, and planning for drought and climate change.

### **John Fio**

John Fio is a founding principal of HydroFocus, Inc. His experience includes almost ten years of research and project leadership with the U.S. Geological Survey, and more than 20 years in private consulting. His tool box includes numerical flow and transport modeling, geochemical modeling, and chemical, isotopic, and age-dating techniques.

### **Rick Cramer**

California PG and Groundwater Technologies Manager at Burns & McDonnell Brea, CA office with over 25 years of groundwater experience. He began his professional career in the petroleum industry and pioneered the application of sequence stratigraphy to groundwater projects. MS degree in geology from UC Davis and a BS degree in geology from University of the Pacific.

### **John Lambie**

John Lambie, PE, PG, CWRE is a principal hydrogeologist with E-PUR, LLC, a water resource consultancy that emphasizes groundwater as a resource for supply to human health, agriculture, and habitat. In his 34 years as a consultant, John has evaluated aquifers for both storage and extraction of water. John holds two degrees from MIT and has been performing quantitative evaluations using data and mathematical tools. John co-authored a paper with Matt Tonkin in 2014 on the use of multiple time events in a simultaneous geospatial analysis to understand a groundwater aquifer system better.

### **George Paul**

Dr. George Paul is a Senior Agricultural Engineer with Formation Environmental, LLC. George is a biophysically-oriented systems scientist with extensive experience in field measurements and numerical modeling of soil, plant, and hydrologic processes. He has been the lead scientist on projects involving irrigation performance, crop modeling, soil-water conservation, rainfall-runoff modeling, evapotranspiration (ET) modeling, climate change impact-adaptation modeling, and drought-flood studies. George has evaluated and incorporated improvements to major remote sensing based surface energy balance algorithms including SEBAL, METRIC, SEBS, and TSM. He was the community leader of the Evapotranspiration (ET) Measurement and Modeling community, and Global Climate Change community in the American Society of Agronomy (ASA).

### **Adam Questad**

Adam Questad is a licensed civil engineer with Geosyntec Consultants. He has worked on water quality compliance and stormwater management projects throughout California including modeling for several enhanced watershed management plans, advanced biofilter designs to support grant applications and meet TMDL receiving water limits, and industrial general permit regulatory support.

### **Maygan Cline**

Maygan Cline is a licensed professional geologist with Geosyntec Consultants with 10 years of experience. She has worked on groundwater quality, remediation, and compliance projects throughout Central and Southern California for both public and private clients. She is currently supporting GSAs and Adjudicated Basins in Southern California with SGMA compliance.

### **Michael Milczarek**

Mike Milczarek has 25 years of experience in developing, implementing, and managing vadose zone, and hydrogeologic studies. His experience ranges from managing or participating in numerous groundwater recharge feasibility studies, designing and implementing groundwater recharge/ sediment removal riverbed filtration studies, evaluating and modeling recharge in riparian habitat restoration areas and designing and implementing investigations on stormwater capture and recharge in ephemeral streams.

### **Timothy Leo**

Tim Leo is a Principal Hydrogeologist at Montgomery & Associates in Tucson, Arizona. For over 25 years, Tim has participated in numerous hydrogeologic investigations for a variety of groundwater resource projects, including modeling, water supply, and contamination studies. In tandem with other recharge experts at M&A, his recent work has focused on recharge projects in CA. Tim is currently leading M&A's CA operations.

### **Jill Weinberger**

Jill Weinberger is a senior hydrogeologist at Dudek working in the fields of groundwater supply and development, water resource management, and groundwater contamination. Dr. Weinberger has been the technical lead on projects evaluating the complex interactions between surface water and groundwater in fractured rock aquifers, assessing the potential for on-shore pumping to induce seawater intrusion in coastal aquifers, and quantifying the transpiration demands of native vegetation in a changing climate. Dr. Weinberger has also been involved with alternative intake assessments for desalination projects and litigation support for contaminated groundwater sites in California. Over the past two years, Dr. Weinberger has assisted water districts, municipalities and agencies implement the requirements of the Sustainable Groundwater Management Act

### **Tara Moran**

Tara began her research in water resource management analyzing the isotopic composition of water isotopes wintertime storm systems in the Canadian Rocky Mountains. After completing her Ph.D. at the University of Calgary in paleoclimatic reconstructions from Arctic ice cores, Tara transitioned to applying geophysical methods to improve the characterization of groundwater aquifers. In her current role



as Program Lead for Stanford University's Water in the West Sustainable Groundwater Program, Tara's research interests focus on the technical requirements of sustainable water management, including data collection, sharing and integration. She is particularly interested in understanding the role of data and information in water management decisions and the governance structures to support them. She works with interdisciplinary research teams to develop solutions to the legal, technical and governance challenges of sustainable groundwater management under recently enacted legislation regulating groundwater management in California. Tara has published many peer-review publications, white papers and book sections on a variety of water-related topics, including groundwater modeling, water isotopes, geophysical methods, data visualization, and groundwater science and policy. She holds a first-class honors B.Sc. in Environmental Science and a Ph.D. in Geography from the University of Calgary, Canada.

### **Steve Phillips**

Steve Phillips has been a Hydrologist with the U.S. Geological Survey (USGS) California Water Science Center (CAWSC) for 33 years. His primary experience and interests involve using simulation models to better understand hydrologic systems and developing tools to help manage these systems. Most of his career has been spent addressing issues related to irrigated agriculture, artificial recharge, land subsidence, and associated water-supply issues in the San Joaquin and Antelope Valleys, California. He currently serves as coordinator for the USGS CAWSC's work related to SGMA, and is the Vice President of GRA.

### **Sam Boland-Brien**

Sam Boland-Brien is manager of the State Water Resource Control Board's Groundwater Management Program. Sam oversees the State Water Board's intervention activities within the overall implementation of the Sustainable Groundwater Management Act (SGMA). Prior to working on SGMA, Sam worked in the State Water Board's Division of Water Rights. He is a civil engineer by education with a Bachelor of Science and a Master of Science focused on water resources. Sam is a licensed Professional Engineer.

### **Dane Mathis**

Supervising Engineering Geologist with the California Department of Water Resources (DWR), Division of Integrated Regional Water Management. Dane has a B.S. degree in Geology from California State University Fresno, and is a Registered Professional Geologist, Certified Engineering Geologist, and a Certified Hydrogeologist. At DWR, Dane manages a staff of geologists, engineers, and environmental scientists which provide support for major statewide programs such as the Sustainable Groundwater Management Program, the California Statewide Groundwater Elevation Monitoring Program, the California Water Plan, and the Integrated Regional Water Management Program.

### **Amy Woodrow**

Amy Woodrow is a Hydrologist with the Monterey County Water Resources Agency, where she works on a wide range of water resources planning and management projects. Prior to her tenure with Monterey County, Amy was a geologist for an environmental consulting firm based in Pittsburgh, PA. Amy is a licensed Professional Geologist in the State of California. She has an M.S. in Geology and a B.S. in Geology and Science & Technology Studies, both from Rensselaer Polytechnic Institute.

### **Jack Rice**

Jack Rice is an Associate Counsel of the California Farm Bureau Federation. He represents Farm Bureau membership in a variety of environmental matters, with a particular focus on water and endangered species issues. Jack grew up in agriculture, and maintains those roots with a small hay and cattle operation in Humboldt County and a grassfed beef business. He is a graduate of the University of California at Davis School of Law.





## **SGMA CONFERENCE** **TOOLS FOR DEVELOPING A GSP**

A critical step for compliance with the Sustainable Groundwater Management Act (SGMA) is the development of a successful Groundwater Sustainability Plan (GSP). This conference focuses on tools and techniques that can support key elements and programmatic considerations for GSP development.



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