



San Juan, Puerto Rico, USA | 22-27 January 2017

**AGU Chapman  
Conference on  
Extreme Climate  
Event Impacts on  
Aquatic  
Biogeochemical Cycles  
and Fluxes**

# PROGRAM COMMITTEE

## Conveners

**Shreeram Inamdar**

University of Delaware, USA

**Bill McDowell**

University of New Hampshire, USA

**James Shanley**

USGS, Vermont, USA

**Elizabeth Minor**

University of Minnesota, USA

**Ji-Hyung Park**

Ewha Womans University, Republic of Korea

## Program Committee

**Arthur Gold**

University of Rhode Island, USA

**Hjalmar Laudon**

Swedish University of Agricultural Sciences

**Sujay Kaushal**

University of Maryland, USA

**Rosemary Fanelli**

University of Maryland, USA

**Andrew Sharpley**

University of Arkansas, USA

**Margaret Palmer**

University of Maryland, USA

**Grizelle Gonzalez**

International Institute of Tropical Forestry, Puerto Rico

# THANK YOU TO OUR SPONSORS

The organizers of this Chapman Conference wish to acknowledge the generous support of the following:



United States Department of Agriculture  
National Institute of Food and Agriculture



National CZO Network

Luquillo CZO

US Forest Service **International Institute of  
Tropical Forestry**

# **Schedule for Chapman Conference Field Trip**

## **Wednesday, 25 January**

**8:00 -9:00 am** – Talks at the Marriott San Juan hotel in Ballrooms III-IV

**Dr. Ariel Lugo Plenary talk.** Introduction and overview of research and impact of extreme events on tropical urban and forest ecosystems. [15 minute talk followed by 5 minutes of questions and discussions]

**Invited talk by Dr. Bill McDowell.** Ecological research in tropical ecosystems and impacts of extreme climate events on stream chemistry and ecology. [15 minute talk with 5 minutes of questions/discussions]

**Invited talk by Dr. Grizelle Gonzalez.** Ecological and social aspects of tropical forest responses to climate change in the Luquillo Experimental Forest, PR [15 minute talk with 5 minutes of questions/discussions]

**9:15 – 9:45 am** – Drive from hotel to Río Piedras site

**9:45 – 10:15 am** – Visit to Urban site at Río Piedras

**10:15 – 11:15 am** – Travel to Sabana Field Research Station (El Yunque National Forest)

**11:15 am – 12:00 pm: Lunch Break** (Sabana Field Research Station, restroom stop)

**12:00 – 12:20 pm** – Travel to Bisley Experimental Watersheds

**12:20 – 1:10 pm** – Hike in and out Quebrada 1, Bisley Experimental Watersheds. Interpretative talk by Dr. Bill McDowell

**1:10 – 1:20 pm** – Drive to USGS gage at Río Mameyes; Stop at Río Mameyes.

**1:20 - 1:40 pm** – Interpretative talk by Dr. James Shanley

**1:40 – 3:30 pm** – Hike down Angelito Trail. The group will split in two groups near the bottom of the trail (and later switch). One interpretive talk by Dr. Tamara

Heartsill (by wooden bridge); Another interpretive talk by Dr. Omar Pérez-Reyes (by river pool, bottom of the trail)

**3:30 pm** – Drive to Yokahu Tower

**4:00 pm** – Arrival at Yokahu Tower

**4:45 pm** – **Drive back to San Juan Marriott.** To return not later than 6 pm.

## Scientific Program

SUNDAY, 22 JANUARY

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4:00 p.m.– 7:30 p.m.      **Registration**  
Upper Pool Deck

6:00 p.m.– 7:30 p.m.      **Ice Breaker Reception**  
Upper Pool Deck

MONDAY, 23 JANUARY

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7:00 a.m.– 8:00 a.m.      **Continental Breakfast**  
Ballroom III-IV

8:00 a.m.– 8:15 a.m.      **Welcome and Overview**  
Presiding: Shreeram Inamdar  
Ballroom III-IV

8:20 a.m.– 10:00 a.m.      **Defining Extreme Climate Events (ECE) and  
Measuring, Recording, and Sampling Their  
Impacts**  
Presiding: James Shanley  
Convener(s): Shreeram Inamdar  
Ballroom III-IV

- 8:20 a.m. –8:40 a.m. **Melinda Dianne Smith** | An ecological perspective on extreme climatic events (ECEs)
- 8:40 a.m. -9:00 a.m. **Douglas A Burns** | Expectations for Increases in the Magnitude and Frequency of Peakflows with Future Climate Change: the Need to Validate Study Approaches
- 9:00 a.m. –9:20 a.m. **Lindsey Rustad** | A New Framework for Understanding the Impacts of Extreme Climatic Events (ECE) on Terrestrial and Aquatic Ecosystems: Integrating a New Generation of ECE Experiments, ‘Smart’ Monitoring Technology, and Rapid Assessment Teams (RATS)
- 9:20 a.m. –9:40 a.m. **Cliff Dahm** | Extreme Water Quality Degradation Following Catastrophic Forest Fires
- 9:40 a.m. –10:00 a.m. **Francois Birgand** | Continuous water quality to capture all events: how good are the new sensors?
- 10:20 a.m.– 12:00 p.m. **Export, Transport, and Transformation of C, N, and P Through the Fluvial/Aquatic Network From the Source to the Sea**  
Presiding: Ji-Hyung Park  
Convener(s): Shreeram Inamdar, Hjalmar Laudon  
Ballroom III-IV
- 10:20 a.m. -10:40 a.m. **Andrew C Wilcox** | Extreme Rainfall and Flooding in the Hyperarid Atacama Desert, Chile
- 10:40 a.m. –11:00 a.m. **Peter A Raymond** | Hydrologic events and watershed biogeochemistry: The Pulse Shunt Hypothesis
- 11:00 a.m. –11:20 a.m. **Nobuhito Ohte** | Effects of extreme events on nitrogen export from forested headwater catchments
- 11:20 a.m. –11:40 a.m. **Sarah Godsey** | Hydrologic Connectivity and Threshold Behavior Influences Nutrient Export from Arctic Hillslopes
- 11:40 a.m. –12:00 p.m. **Wilfred M Wollheim** | Changes in biogeochemical supply and demand during storm events alter the role of river networks in controlling downstream exports

12:00 p.m.– 1:30 p.m.

## **Lunch**

Tuscanys

1:30 p.m.– 3:00 p.m.

## **Defining Extreme Climate Events (ECE) and Measuring, Recording, and Sampling Their Impacts Posters**

Presiding: James Shanley

Convener(s): Shreeram Inamdar

Ballroom II

M-05

**Daniel M Hanes** | The “historic” Meramec River Basin Flood of 2015

M-06

**Shreeram P Inamdar** | How will large storms alter particulate organic matter exports and composition and impact water quality of receiving aquatic ecosystems?

M-07

**Jian-Cheng Kang** | Spatial and temporal distribution of Northwest Pacific tropical cyclone and its relationship with sea surface temperature

M-08

**Alan Knapp** | Precipitation Extremes Vary in Space and Time: Implications for Designing Experiments

M-09

**Jonathan Morrison** | Use of a Continuous Water-Quality Monitor to Examine Sediment and Nutrient Transport in the Lower Connecticut River during Tropical Storm Irene 2011.

M-10

**Wilfred M Wollheim** | Controls on Storm Event Transport of Nitrate and DOC Derived Using Sensor based Monitoring Approach.

M-13

**James B Shanley** | Biogeochemical response to extreme events at the five USGS WEBB watersheds

M-14

**Kurt Solander** | Characterizing shifts in historical streamflow extremes in the Colorado River Basin, USA

M-15

**Terry Loecke** | Using high-frequency in-situ stream nitrate concentration sensors to understand importance of extreme precipitation events in nitrogen loading

1:30 p.m.– 3:00 p.m.

**Export, Transport, and Transformation of C, N, and P Through the Fluvial/Aquatic Network From the Source to the Sea Posters**

Presiding: Ji-Hyung Park

Convener(s): Hjalmar Laudon, Shreeram Inamdar

Ballroom II

- M-18 **Morvarid Azizian** | *Direct and Indirect Effects of Extreme Climate Events on Nitrate Processing by Streams*
- M-21 **Jacob D Hosen** | Testing the Pulse-Shunt Hypothesis: In Situ Data Reveal Hydrological Extremes and Scaling Controls on Carbon Uptake in a River Network.
- M-23 **Erin R Johnson** | POM Pulses: Characterizing the physical and chemical properties of particulate organic matter (POM) mobilized by large storm events and its influence on receiving fluvial systems
- M-24 **Diana L Karwan** | Water and Material Sources and Pathways During Extreme and Non-Extreme Events in White Clay Creek, Pennsylvania, USA
- M-25 **Amanda Knobloch** | The Effects of Winter Storm Cato on the Composition and Flux of Carbon at the Marsh-Estuarine Interface
- M-26 **Lauren Koenig** | Response of metabolism and fluvial carbon flux to anomalous low flows in New Hampshire streams
- M-27 **Erin R Johnson** | After the Storm: Assessing the Content, Transformation, and Fate of Nitrogen in Floodplain Sediments in Aquatic Ecosystems
- M-28 **Ken'ichi Osaka** | The influence of extreme storms on nitrogen export from mountain forest watershed
- M-29 **Donald S Ross** | Changes in Near-Stream Soil Phosphorus Resulting from Extreme-Event Driven Erosion
- M-30 **Richard Douglas Rowland** | Large storms and particulate organic matter (POM) export: Changes in particle size, composition and source



- M-31 **JohnFranco Saraceno** | High-frequency dissolved organic matter quality variations during “Super Storm” Sandy
- M-32 **Daniel Scott** | Comparing the Resiliency of Organic Carbon Storage in Two Mountain River Basins to Extreme Disturbance
- M-33 **Peng Shang** | Hydrological effects on dissolved organic matter export from a temperate forested watershed across timescales from minute to season
- M-34 **Byungman Yoon** | Extent of Dissolved Organic Matter Lability and Prevalence of Priming Effect in Connecticut River: Implication of Precipitation Event, Seasonality, and Land Cover
- M-35 **Shaowu Bao** | Water and Nutrients Exports during an Extreme Flooding Event in South Carolina
- 3:00 p.m.– 7:00 p.m. **Free Time and Dinner**
- 7:00 p.m.– 8:30 p.m. **Defining Extreme Climate Events (ECE) and Measuring, Recording, and Sampling Their Impacts Breakout Session**  
Presiding: James Shanley  
Ballroom I
- 7:00 p.m.– 8:30 p.m. **Export, Transport, and Transformation of C, N, and P Through the Fluvial/Aquatic Network From the Source to the Sea Breakout Session**  
Presiding: Ji-Hyung Park  
Ballroom III-IV

## TUESDAY, 24 JANUARY

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- 7:00 a.m.– 8:00 a.m. **Continental Breakfast**  
Ballroom III-IV
- 8:20 a.m.– 10:00 a.m. **Long Term Impacts and Recovery of Ecosystems; Lessons From Past Extreme Events**

Presiding: William McDowell

Convener(s): James Shanley

Ballroom III-IV

8:20 a.m. –8:40 a.m.

**Peter Groffman** | Shooting at a moving target: Evaluating ecosystem response to extreme events in a changing world

8:40 a.m. –9:00 a.m.

**Charles T Driscoll** | Response of soil and streamwater of watersheds in the Great Smoky Mountains National Park to fire disturbance.

9:00 a.m. –9:20 a.m.

**Robert M Hirsch** | Exploring the hypothesis of a “flood-reset” of the sediment and nutrient delivery in some Eastern U.S. watersheds

9:20 a.m. –9:40 a.m.

**Karen C Rice** | Riverine Discharges to Chesapeake Bay: Analysis of Long-Term (1927-2014) Records and Implications for Future Flows in the Chesapeake Bay Basin

9:40 a.m. -10:00 a.m.

**Rodrigo Vargas** | Ecological implications of hurricane disturbances: immediate responses, resiliency, and recovery

10:20 a.m.– 12:00 p.m.

## **Changes in Aquatic Ecosystem Structure, Functions, and Services**

Presiding: Elizabeth Minor

Convener(s): William McDowell

Ballroom III-IV

10:20 a.m. –10:40 a.m.

**Hans W. Paerl** | Impacts of tropical cyclones on North Carolina estuarine and coastal carbon and nitrogen dynamics: Implications for biogeochemical cycling and water quality in a stormier and warmer world

10:40 a.m. -11:00 a.m.

**Robert Thomas Hensley** | Episodic Flow Reversals as a Driver of Ecosystem Change in Florida’s Springs

11:00 a.m. –11:20 a.m.

**Jinjun Kan** | Storm Events Restructured Microbial Community and Their Biogeochemical Potentials

11:20 a.m. –11:40 a.m.

**Cristina D. Takacs-Vesbach** | An Extreme Flood Event Marks a State Change in an Antarctic Aquatic Ecosystem

- 11:40 a.m. –12:00 p.m. **Laurel Larsen** | Effects of Extreme Drought on the Organic Carbon Dynamics and Hydroecology of Intermittent, Salmon-bearing Streams
- 12:00 p.m.– 1:30 p.m. **Lunch**  
Tuscanys
- 1:30 p.m.– 3:00 p.m. **Long Term Impacts and Recovery of Ecosystems; Lessons From past Extreme Events Posters**  
Presiding: William McDowell  
Convener(s): James Shanley  
Ballroom II
- T-01 **Sheila F Murphy** | Windward/leeward rainfall gradients in the Luquillo Mountains, Puerto Rico, and implications for water resources and biogeochemical fluxes
- T-02 **Brent D Newman** | Effects of Drought on the Chemistry and Isotopic Composition of Soil Waters in Tropical Forests of Puerto Rico
- T-03 **Nicolas Perdrial** | Can the mineralogical signature of suspended sediments inform on the dynamics and resilience of river systems impacted by extreme climate events at Luquillo, Puerto Rico?
- T-04 **Sandra Petrakis** | Influence of experimental extreme water pulses on greenhouse gas emissions from soils
- T-05 **Bianca Rodriguez-Cardona** | Major Wildfires Affect Stream Carbon and Nutrient Concentrations in Permafrost Dominated Basins in The Central Siberian Plateau
- T-07 **Rolf Vieten** | The Impact of Hurricane Bertha on Seepage Water in Cueva Larga, Puerto Rico
- T-09 **William H McDowell** | Impacts of Catastrophic Hurricanes on Stream Chemistry in Tropical Montane Forests are Long-Lasting, Context Dependent, and Vary by Critical Zone Architecture

- T-10 **Tammy A Newcomer Johnson** | Dams and ECEs: Sink or Source of Nutrients?
- T-11 **Noah Van Hartesveldt** | Potential new avenues for expediting recovery of long-dead *Acropora palmata* skeletons.
- T-13 **Jesse Clark Vermaire** | The impact of climate-driven increases in wildfire intensity on metal deposition to lakes and peatlands in the North Slave Region, NWT, Canada.
- T-15 **Sheila F Murphy** | High-Intensity Rain Storm Connects Hillslopes to Channels in a Steep Semi-Arid Catchment
- 1:30 p.m.– 3:00 p.m. **Changes in Aquatic Ecosystem Structure, Functions, and Services Posters**  
Presiding: Elizabeth Minor  
Convener(s): William McDowell  
Ballroom II
- T-17 **Ellen M Cooney** | Impact of Extreme Rain Events on Lake Superior's Biogeochemistry
- T-18 **Emily Santos** | CHARACTERIZING THE ORGANIC MATTER IN SURFACE SEDIMENTS FROM THE SAN JUAN BAY ESTUARY
- T-20 **Carmen Aguilar** | The Great Midwest Flood of 2008 Reflected in Great Lake Michigan Biogeochemistry and Phytoplankton Sequences: Resurgence of Diatoms Provided Beneficial Consequences for a Ravaged Great Lake Food Web
- T-21 **Karthik Balaguru** | Impact of Hurricanes on Coastal Biogeochemistry in the Gulf of Mexico
- T-22 **Russell Lee Cuhel** | The Massive Upwelling of 2015 Reflected in Great Lake Michigan Biogeochemistry and Phytoplankton Sequences: Resurgence of Diatoms Provided Beneficial Consequences for a Ravaged Great Lake Food Web
- T-23 **Joseph Salisbury** | Perturbation and Recovery of Sea Surface pCO<sub>2</sub> During Extreme Events.

- T-24 **Angelia Seyfferth** | Impacts of a Hurricane-Induced Storm Surge on Trace-Metal Cycling in a Spatially Heterogeneous Estuary
- T-25 **Asim Zia** | Combined Temperature and Precipitation Variability May Increase the Frequency of Harmful Algal Blooms in Lake Champlain, 1992-2100
- T-28 **Minjin Lee** | Increased climate variability and extremes amplify risks of coastal hypoxia worldwide: Implications of enhanced basin memory effects on river dissolved nitrogen in the GFDL Earth system modeling framework
- T-29 **Andrew W Schroth** | Iron speciation and provenance during high flow events from catchments to receiving
- T-30 **Chun-Mao Tseng** | Changjiang floods enhance the CO<sub>2</sub> uptake of the East China Sea
- T-32 **John R White** | Estuarine ecosystem dynamics during a climate-influenced, early-season Mississippi River flood diversion
- T-33 **Scott Andres** | Meteorological Forcing of the Biogeochemistry of the Murderkill River and Estuary (Delaware, USA) Determined by High Frequency Continuous Monitoring
- 3:00 p.m.– 7:00 p.m. **Free Time and Dinner**
- 7:00 p.m.– 8:30 p.m. **Long Term Impacts and Recovery of Ecosystems; Lessons From Past Extreme Events Breakout Sessions**  
Presiding: William McDowell  
Ballroom I
- 7:00 p.m.– 8:30 p.m. **Changes in Aquatic Ecosystem Structure, Functions, and Services Breakout Session**  
Presiding: Elizabeth Minor  
Ballroom III-IV

**WEDNESDAY, 25 JANUARY**

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7:00 a.m.– 8:00 a.m.

**Continental Breakfast**

Ballroom III-IV

## THURSDAY, 26 JANUARY

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8:20 a.m.– 10:00 a.m.

**Differences in ECE Impacts Across Forested, Agricultural and Urban Landscapes**

Presiding: Sujay Kaushal

Convener(s): Arthur Gold, Andrew Sharpley

Ballroom III-IV

8:20 a.m. –8:40 a.m.

**Marguerite A. Xenopoulos** | Disentangling the Effects of Agriculture Land Use on the Export of Nutrients and Carbon During Flooding Events

8:40 a.m. –9:00 a.m.

**Susana Bernal** | *Being used to it: impacts of seasonal extreme climate events on C and N cycling in Mediterranean catchments*

9:00 a.m. –9:20 a.m.

**Philippe Vidon** | Climate Variability and Gas Fluxes in Agricultural Riparian Zones

9:20 a.m. –9:40 a.m.

**Eran W Hood** | Climate-driven changes in organic carbon export from coastal temperate rainforest watersheds

9:40 a.m. –10:00 a.m.

**Amy J Burgin** | Weather Whiplash in Agricultural Regions Drives Deterioration of Water Quality

10:20 a.m.– 12:00 p.m.

**Watershed Management Practices and Aquatic Restoration Strategies to Mitigate Impacts of Extreme Climate Events**

Presiding: Margaret Palmer

Convener(s): Arthur Gold, Rosemary Fanelli

Ballroom III-IV

10:20 a.m. –10:40 a.m.

**Nancy B Grimm** | Designing Social-Ecological-Technological Systems (SETS) to Build Resilience to Extreme Weather-Related Events in Urban Environments

- 10:40 a.m. –11:00 a.m. **Ellen Wohl** | Building Carbon Storage and Resilience to Extreme Climate Events into River Management
- 11:00 a.m. –11:20 a.m. **Emily S Bernhardt** | Fast and slow responses of coastal freshwater ecosystems to salt water intrusion events
- 11:20 a.m. –11:40 a.m. **Jennifer Leah Tank** | Watershed-Scale Conservation, Through Changing Land Cover, Reduces Nutrient Export From Agroecosystems Even Under Changing Hydrology.
- 11:40 a.m. –12:00 p.m. **Andrew N Sharpley** | Conservation strategies and nutrient and sediment reduction in agricultural watersheds in light of Extreme Climate Events
- 12:00 p.m.– 1:30 p.m. **Lunch**  
Tuscanys
- 1:30 p.m.– 3:00 p.m. **Differences in ECE Impacts Across Forested, Agricultural and Urban Landscapes Posters**  
Presiding: Sujay Kaushal  
Convener(s): Arthur Gold, Andrew Sharpley  
Ballroom II
- R-01 **Yuehan Lu** | Storm Event Exports of Dissolved Nutrients in a Large Agricultural River Basin in Arid Northwestern China
- R-02 **Rosemary M Fanelli** | Quantifying nutrient fluxes and composition during extreme climate events in the Susquehanna River: Application for continuous water quality monitoring
- R-04 **Young-II Moon** | Climate change and urban flood damage in Korea
- R-05 **Hem K. Pokharel** | Simulating Hydrology and Water Quality to Predict Stream Discharge, Nitrate Loads Under Climate Change Scenarios in Maidford River Basin, Rhode Island Using SWAT Model
- R-06 **Kelly Addy** | Nutrient and Carbon Loading from Forested, Urban, and Agricultural Watersheds during Extreme Climatic Events

- R-07 **Danny Croghan** | Characterising Organic Matter composition during extreme events in-stream and within terrestrial sources in a small, urban, headwater catchment in Birmingham, UK.
- R-08 **Shahan Haq** | Controls on River Salinization and its Relationship to Nitrogen
- R-09 **Hewley A Imbuzeiro** | Simulating drought impacts on energy balance in an Amazonian rainforest
- R-10 **Sujay Kaushal** | The impact of extreme storms on water quality in human-dominated watersheds
- R-11 **Ethan Kyzivat** | Characterizing storm event riverine dissolved organic carbon through ramped temperature oxidation
- R-12 **Henry Finnie Wilson** | Landform and Agricultural Management Characteristics Influencing C, N, P Export With Extreme Rainfall Driven Flows in the Assiniboine River Watershed
- R-13 **Alessandra Marzadri** | Droughts and Nitrous Oxide Emissions in Agricultural and Forested Watersheds.
- R-15 **Molly Welsh** | Changes in riparian and stream hydrology and biogeochemistry following storms in an agricultural watershed
- R-16 **Kathryn E Clark** | Impacts of extreme climate events - droughts and hurricanes - on carbon and nitrogen in streams draining the Luquillo Mountains in Puerto Rico
- R-18 **Ashley A Coble** | Evaluating the role of large-scale fires on nutrient uptake in Arctic streams underlain with permafrost
- R-30 **Sara McMillan** | Stormwater biogeochemistry in urban stream networks

1:30 p.m.– 3:00 p.m.

## **Watershed Management Practices and Aquatic Restoration Strategies to Mitigate Impacts of Extreme Climate Events Posters**

Presiding: Margaret Palmer

Convener(s): Arthur Gold, Rosemary Fanelli



Ballroom II

- R-19 **Michael R Williams** | Stream Restoration Performance and its Contribution to the Chesapeake Bay TMDL: Challenges Posed by Climate Change in Urban Areas
- R-21 **Jud W Harvey** | Importance of Fine Sediment Dynamics in Ecological Alterations of Urban Headwater Streams
- R-22 **Ehab A Meselhe** | Development and application of a Biophysical-Surge-Wave Model
- R-23 **Francesca Messina** | Coastal Eco-morphological Real-time Forecasting (CERF) System
- R-24 **Durelle Scott** | The Role of Floodplains through River Corridors: How will increasing reconnection alter downstream export?
- R-25 **Amy T Hansen** | The Potential of Wetlands to Contain Agricultural Nitrate Under Extreme Streamflow Events
- R-26 **Christina (Naomi) Tague** | Why subsurface features matter for managing forests, water and fire in the face of increasing drought frequency and severity
- R-28 **Xuesong Zhang** | Implications of future changes in climate extreme events for aquatic biogeochemical cycles and associated ecosystem services of the St. Croix National Scenic Riverway
- R-29 **Zachary E Kayler** | Potential landscape and nutrient constraints on tropical forest biogeochemical resilience

3:00 p.m.– 7:00 p.m.

**Free Time and Dinner**

7:00 p.m.– 8:30 p.m.

**Differences in ECE Impacts Across Forested, Agricultural and Urban Landscapes Breakout Session**

Presiding: Sujay Kaushal

Ballroom I

7:00 p.m.– 8:30 p.m.

**Watershed Management Practices and Aquatic Restoration Strategies to Mitigate Impacts of Extreme Climate Events Breakout Session**

Presiding: Margaret Palmer

Ballroom III-IV

## FRIDAY, 27 JANUARY

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7:00 a.m.– 8:00 a.m.

**Continental Breakfast**

Ballroom III-IV

8:00 a.m.– 8:30 a.m.

**Closing Remarks, Comments and General Discussion**

Presiding: Shreeram Inamdar

Convener(s): William McDowell, James Shanley

Ballroom III-IV

8:30 a.m.– 10:00 a.m.

**Breakout Group Presentations**

Presiding: Shreeram Inamdar

Ballroom III-IV

10:30 a.m.– 12:00 p.m.

**Breakout Group Presentations II**

Presiding: Shreeram Inamdar

Ballroom III-IV

12:00 p.m.– 1:30 p.m.

**Lunch**

Tuscanys