

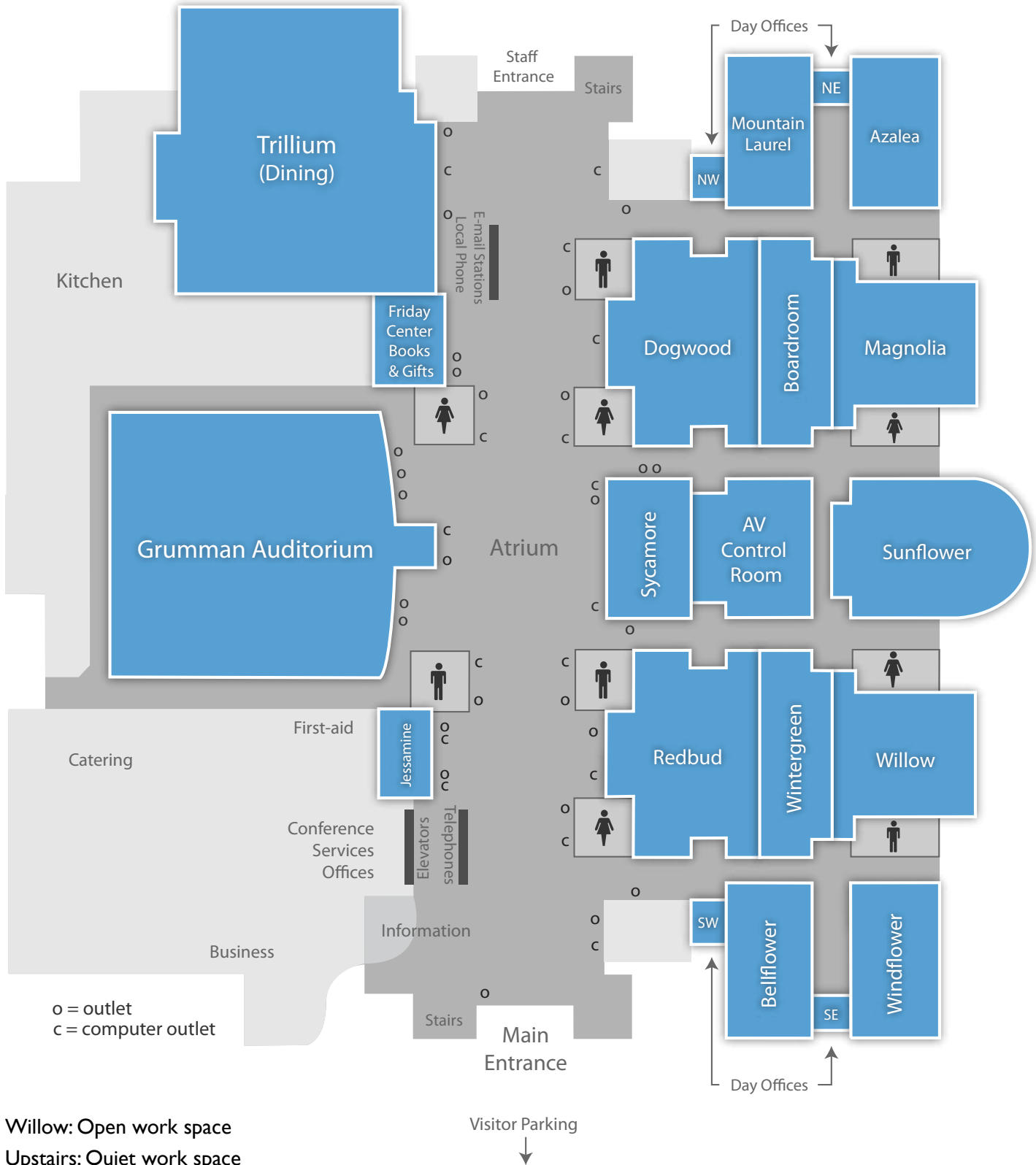


# **WATER & HEALTH** 2017

October 16-20, University of North Carolina-Chapel Hill



UNC  
WATER INSTITUTE





# WATER & HEALTH 2017

OCTOBER 16-20, 2017

UNIVERSITY OF NORTH CAROLINA–CHAPEL HILL

WHERE SCIENCE MEETS POLICY

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# LOCAL INFORMATION

## GENERAL INFORMATION

### Location

The Friday Center, 100 Friday Center Drive, Chapel Hill, NC 27517  
(919) 962-3000

### Schedule

<http://waterinstitute.unc.edu/conferences/waterandhealth2017/>

### Internet

Wireless network is "UNC Guest." Click "Connect," then "Agree to Terms."

### Lost & Found

Please check at Conference Registration and The Friday Center information desk.

### Special Services

Please check with the Friday Center main desk to make arrangements for special needs such as a private location for nursing moms or a room to pray.

### Special Notifications

In the case of any situation requiring the delay or cancellation of any conference sessions or events, attendees will receive an email\* by 6:30 a.m. the day of the event. Notifications will be posted on the conference website.

\*NOTE: Email is based on registration information. If someone else registered you and listed their email instead of yours, you will need to contact them or check the conference website: <http://waterinstitute.unc.edu/conferences/waterandhealth2017/>

### Conference Hotels

- **Courtyard Marriott** (across from The Friday Center)  
100 Marriott Way Chapel Hill, NC 27517 (919) 883-0700 or (800) 321-2211
- **Hampton Inn & Suites Chapel Hill** (east of The Friday Center)  
6121 Farrington Rd. Chapel Hill, NC 27517 (919) 403-8700 or (800) 426-7866
- **Holiday Inn Express Chapel Hill** (east of The Friday Center)  
6119 Farrington Rd. Chapel Hill, NC 27517 (919) 489-7555 or (800) 465-4329
- **Aloft** (1 mile west of The Friday Center)  
1001 S. Hamilton Rd. Chapel Hill NC 27517 (919) 932-7772 or (866) 716-8143

## TRANSPORTATION

**Taxi Service** (before entering the taxi, confirm you are the intended passenger by providing your name)

- Uber – sign up for UBER at [get.uber.com](http://get.uber.com)
- Chapel Hill Taxi Service (919) 407-9747 or [www.chapelhilltaxiservice.com](http://www.chapelhilltaxiservice.com)  
20% senior citizens discount and student ID discounts
- GoodFellas (919) 537-2078 or <http://goodfellastaxinc.com>
- RDU Airport Taxi (919) 840-7277
- RDU Express Taxi (919) 771-8222 or (800) 840-8098 or [www.rduexpresstaxi.com](http://www.rduexpresstaxi.com)  
With student/faculty ID, receive a lower rate to the airport
- Tar Heel Taxi (919) 933-1255, 6119 Farrington Rd. Chapel Hill, NC 27517

### Bus Service

- **Chapel Hill Transit**—[chtransit.org](http://chtransit.org) (919) 969-4900  
<http://www.townofchapelhill.org/town-hall/departments-services/transit>  
The routes that serve the Friday Center directly are the S and the HU  
The FCX runs throughout the day from the park and ride lot on the north side of the building  
There is also the V route, which runs from Meadowmont, across the street
- **Triangle Transit**—[www.gotriangle.org](http://www.gotriangle.org) (919) 485-7433



WHERE SCIENCE MEETS POLICY

# CONFERENCE SHUTTLE SCHEDULE

(Please contact your individual hotel to inquire about alternative shuttle service).

## MORNING SCHEDULE

(From **Hampton Inn, Holiday Inn Express, and Aloft** to **Conference Center**)

**Shuttle pick-up location: Outside main entrance of hotel. SHUTTLES DO NOT WAIT!!!**

HOTEL	Departure Times from Hotels		
Hampton Inn	7:00 a.m.	7:50 a.m.	8:45 a.m.
Holiday Inn Express	7:00 a.m.	7:50 a.m.	8:45 a.m.
Aloft	7:20 a.m.	8:15 a.m.	9:10 a.m.

## AFTERNOON & EVENING SCHEDULE

(From **Conference Center** to **Hampton Inn, Holiday Inn Express, and Aloft**):

**Shuttle pick-up location: Under portico at main entrance (near registration). SHUTTLES DO NOT WAIT!!!**

DAY OF WEEK	Departure Times from Conference Center			
Monday	5:30 p.m.	6:30 p.m.	7:30 p.m.	
Tuesday	5:30 p.m.	6:30 p.m.		
Wednesday	5:30 p.m.	6:30 p.m.	7:30 p.m.	8:30 p.m.
Thursday	5:30 p.m.	6:30 p.m.		
Friday	1:30 p.m.	2:30 p.m.	3:30 p.m.	

## SHOPS & RESTAURANTS

### Meadowmont Village (straight across Rt. 54)

UPS store (mailing & copy services), Wells Fargo Bank, Maupin Travel, Great Clips Haircuts, Elegance Dry Cleaners, Starbucks Coffee Shop, Harris Teeter Grocery Store, and various restaurants

Transportation: ~ 5-minute walk, Taxi or Uber

### Downtown Chapel Hill and UNC Campus 135 East Franklin Street, Chapel Hill, NC 27514

UNC campus, Student Stores, Walgreens, CVS, FedEx Office, shops, bars, restaurants

Shopping and dining information: <http://www.downtownchapelhill.com/>

Parking information: <http://www.parkonthehill.com/>

Transportation: FCX, HU, S, or V Chapel Hill Transit bus to Student Stores; walk or take U/RU to Franklin St.

### Downtown Carrboro 101 East Weaver Street, Carrboro, NC 27510

Weaver Street Market, cafes, shops, bars, restaurants

Information: <http://www.townofcarrboro.org/9/For-Visitors>

Transportation: 800 Bus (GoTriangle) to CW (Chapel Hill Transit)

### New Hope Commons 5428 New Hope Commons Drive, Durham, NC 27707

Walmart, Best Buy, FedEx Office, Marshalls, Barnes & Noble

Transportation: Taxi or Uber

### Printing and Shipping — FedEx Office Print/Ship Centers

114 West Franklin Street, Chapel Hill, NC 27516 (Hours: M-F 7a-11p, 919-967-0790)

5319 New Hope Commons Drive, Durham, NC 27707 (Hours: M-F 7:30a-9p, 919-402-8160)

Transportation: see above

### Streets at Southpoint Mall 6910 Fayetteville Road, Durham, NC 27713

Nordstrom, Macys, Belk's department stores, other shops and restaurants (Hours: 10a-9p, [www.streetsatsouthpoint.com](http://www.streetsatsouthpoint.com))

Transportation: Triangle Transit Bus 800

### Target in South Durham, 8210 Renaissance Pkwy, Durham, NC 27713

Hours: Sun-Thu 7a-11p, Fri-Sat 7a-12a

Transportation: Triangle Transit Bus 800

# SCHEDULE AT A GLANCE

	MON. OCT. 16	TUES. OCT. 17	WED. OCT. 18
8:30	SIDE EVENTS	SIDE EVENTS	SIDE EVENTS
10:00	BREAK	BREAK	BREAK
10:30	SIDE EVENTS	SIDE EVENTS	SIDE EVENTS
12:00	LUNCH	LUNCH	LUNCH
1:00	<b>PLENARY PANEL</b> Understanding Baselines, Indicators and Hurdles to Achieving the SDGs	<b>PANEL</b> Building Resilient Communities to Withstand Increasing Extreme Weather Events' Impact on the Global Water Crisis	<b>PANEL</b> Winning in the Field: Using Research to Fill Evidence Gaps and Contribute to Better Practice in WaSH
2:00		<b>THEME KEYNOTES</b> Brian Arbogast Archana Patkar	<b>THEME KEYNOTES</b> Laurel Firestone Loune Viaud
2:30		BREAK	BREAK
3:30	BREAK	BREAK	BREAK
4:00	VERBAL PRESENTATIONS	VERBAL PRESENTATIONS	VERBAL PRESENTATIONS
5:00	POSTER RECEPTION	POSTER RECEPTION	POSTER RECEPTION
6:00			
6:30			CONFERENCE DINNER
7:00			
8:30			

## THURS. OCT. 19

**SIDE EVENTS**

BREAK

**SIDE EVENTS**

LUNCH

<p><b>PANEL</b></p> <p>Merging Science and Technology with Culture and Tradition</p>	<p><b>THEME KEYNOTES</b></p> <p>Catarina de Albuquerque Rick Gelting David Gute</p>
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BREAK

**VERBAL PRESENTATIONS**

BREAK

**VERBAL PRESENTATIONS**

POSTER RECEPTION

## FRI. OCT. 20

**SIDE EVENTS** 8:30

BREAK

10:00

**SIDE EVENTS** 10:30

LUNCH

12:00

1:00

2:00

2:30

3:30

4:00

5:00

6:30

# SPECIAL EVENTS

## THROUGHOUT THE WEEK

### DAILY

#### **YOUNG PROFESSIONALS LUNCH & LEARN SERIES**

**Wintergreen**

**12:15-1:00 p.m.**

Building on our Monday evening networking event for young professionals, this lunch and learn series will be a daily opportunity for informal discussion focusing on exploring the professional experience and career trajectories of one or two invited practitioners.

#### **FRIDAY CENTER REFUGEE MULTIMEDIA ART EXHIBIT**

**Throughout the Friday Center**

**8:00 a.m. - 8:00 p.m.**

**(closes at 5:00 p.m. on Friday)**

This timely exhibition of 125 portrait photographs and accompanying film allows visitors insight into the plight of refugees, including their efforts to survive, their needs, their dreams and their hopes for a better future. Please note that *REFUGEE* contains some graphic images and content that may not be suitable for all visitors.

See [fridaycenter.unc.edu/refugee](http://fridaycenter.unc.edu/refugee) for more details.

### MON. OCT. 16

#### **YOUNG PROFESSIONALS NETWORKING SESSION**

**Dogwood**

**6:00-7:00 p.m.**

Young professionals and soon-to-be grads: This roundtable event will be an opportunity for you to connect with experienced practitioners to discuss the transition into practice. This event is included in your registration fee, so join us after the poster session for a chance to learn from your peers.



**International Association  
of Plumbing and  
Mechanical Officials**

**Dedicated to protecting public health and safety  
everywhere**

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- Learn about our projects in India, Indonesia, Philippines, South Africa and elsewhere!

***Be sure to talk to us at the Water & Health Conference!***

Lives are changed through access to a safe drinking water supply and reliable sanitation systems

**[www.iapmo.org](http://www.iapmo.org)**



## TUES. OCT. 17

### WaSH POLICY RESEARCH DIGEST PANEL DISCUSSION

Wintergreen

7:30-8:30 a.m.

#### Is Community Management an Efficient and Effective Model of Rural Water Supply Service Delivery?

The issue of community management of rural water supplies has attracted interesting debate recently. An RWSN blog post by ELLIE CHOWNS, at that time a researcher at the University of Birmingham, prompted a lively discussion in the RWSN online Sustainable Services and Equality, Non-Discrimination & Inclusion communities. In parallel to this The Water Institute at UNC, in consultation with RWSN, chose a recent paper by CHOWNS as the publication to review for the most recent WaSH Policy Research Digest, accompanied by a short literature review written by HAROLD LOCKWOOD of Aguaconsult, based on work he was doing for the World Bank on a multi-country review of rural water service sustainability.

The Water Institute at UNC and RWSN will jointly host a one-hour panel discussion which will be live streamed. Short moderated interventions from panelists will be followed by questions from the audience received both in person and online. The discussion will be designed to bring out diverse points of view (for instance, community management has not worked and should be abandoned vs. that it is still a viable model) but also to explore the nuances of the circumstances under which well-supported community management can be successful. The discussion will also be recorded and made available on the RWSN and The Water Institute at UNC websites.

#### Panel:

- HAROLD LOCKWOOD, director, Aguaconsult UK
- ELLIE CHOWNS, evaluation and research specialist, VSO
- ENG. AARON KABRIZI, director, Ministry of Water and Environment, Uganda
- VIDA DUTI, country director, IRC Ghana
- Moderator: CLARISSA BROCKLEHURST, adjunct faculty, The Water Institute, UNC
- Online host: DAVID FUENTE, assistant professor, School of Earth, Ocean & Environment, University of South Carolina

## WED. OCT. 18

### PHOTOBOOTH SESSION

Trillium Dining Room

6:30-8:30 p.m.

Don't miss your chance to make memories in the photobooth at the Conference Dinner!  
Sponsored by Watermill Express.

## FRI. OCT. 20

### INTERNATIONAL PROJECT MANAGEMENT WORKSHOP

Mountain Laurel

9:00 a.m. - 4:00 p.m.

From the garden pond to a national borehole program, the importance of good project management skills cannot be overemphasized. As resources allocated to WaSH programs grow increasingly scarce, using these resources (financial, human, equipment) wisely is a fundamental responsibility for all practitioners. This workshop will help participants identify the key characteristics of a successful project and how to nurture them.

During this workshop participants will:

- Explore why projects and programs frequently run into problems
- Discuss the realities of "on-time" and "on-budget" projects
- Learn to recognize the danger signs of failing projects and how to mitigate them

#### About the Instructor

**Nigel Stuart** is an engineer with over 20 years of project management experience specializing in software implementation and construction related to WaSH projects. Most recently, he has been engaged in efforts to improve water and sanitation systems in communities that house refugees displaced by the crisis in Syria. Stuart has a bachelor's in civil engineering from the University of Portsmouth, a master's in business administration from the University of Bradford and is a graduate of the U.K. Military Academy.

# DETAILED SCHEDULE

## MONDAY OCT. 16

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8:30 a.m.

### SIDE EVENTS

**The WaSH in Schools Annual Meeting: Towards Achieving WinS SDGs by 2030**

Convened by Global WinS Network

**Redbud**, *continues after the break*

**Drinking Water Safety through Partnership: Engaging the Private Sector in Water Quality Monitoring for WaSH Projects**

Convened by U.S. Agency for International Development, The Coca-Cola Company, Global Water Challenge, The Global Water Project

**Dogwood**, *continues after the break*

**Rethinking Rural Sanitation: Practical Pathways to Outcome-Focused Programming**

Convened by USAID, Bill & Melinda Gates Foundation, UNICEF, WaterAid, Plan, PSI, UNC

**Sunflower**, *continues after the break*

**Delivering a Large Scale Multi-Layered Behaviour Change Campaign in Low-Income Country Pakistan**

Convened by WaterAid Pakistan

**Mountain Laurel**

**Drinking Water Safety in the U.S.: Risk Quantification, Mitigation, and Communication**

Convened by RTI International USA, UNC Gillings School of Global Public Health

**Windflower**, *continues after the break*

**Strengthening Governance and Regulation of Water and Sanitation Services Towards the Realization of the SDGs**

Convened by World Health Organization

**Azalea**

10:00 a.m.

### BREAK

10:30 a.m.

## SIDE EVENTS

*Programs in these rooms continue from the 8:30–10 session.*

**Redbud, Dogwood, Sunflower, Windflower**

**WaSH for Maternal and Neonatal Health: Behaviors, Birth Kits, and Indicators**

Convened by USAID Maternal and Child Survival Program (MCSP), Save the Children

**Bellflower**

**How You Can Improve Your Behavior Change Interventions by Inferring which Behavioral Factors They Address**

Convened by Eawag, Helvetas

**Mountain Laurel**

**HWTS: Advancing the SDG Water Safety Agenda: Meeting of the WHO/UNICEF International Network on Household Water Treatment and Safe Storage**

Convened by World Health Organization, UNICEF, The Water Institute, CAWST

**Azalea**

12:00 p.m.

## LUNCH

**Trillium Dining Room,**  
overflow seating in **Tent & Magnolia**

### **YOUNG PROFESSIONALS LUNCH & LEARN SERIES**

**Wintergreen**

**12:15–1:00 p.m.**

*See Special Event Descriptions, p. 6.*

# DETAILED SCHEDULE

MONDAY OCT. 16 (cont.)

1:00 p.m.

## PLENARY PANEL

Understanding Baselines, Indicators and Hurdles to Achieving the SDGs

**Grumman Auditorium**, with simultaneous broadcast in **Dogwood**

In partnership with the World Health Organization and UNICEF, we will convene a high-level panel discussion to examine the implications of the baseline numbers published in the 2017 Joint Monitoring Programme report, the first post-MDG assessment. The panel will analyze what steps the WaSH community must take to reach the agreed targets by 2030.

Panelists include:

- BRIAN ARBOGAST, director of the Bill & Melinda Gates Foundation
- CATARINA DE ALBUQUERQUE, executive chair of the Sanitation and Water for All Partnership
- RICK JOHNSTON, technical officer, WHO/UNICEF Joint Monitoring Programme
- WRO FRENESH MEKURIA, state minister for Ethiopia's Water Supply and Sanitation Sector
- PARAM IYER, secretary of India's Drinking Water and Sanitation Ministry
- LUIS SIMAS, head of Drinking Water Quality in Portugal
- TOM SLAYMAKER, senior statistics and monitoring specialist, UNICEF

2:30 p.m.

*Panel continues,*

**Grumman Auditorium**

## VERBAL PRESENTATIONS

### WaSH IN SCHOOLS

#### Redbud

~~Improving the Lives of Children with Disabilities through  
WaSH Monitoring in Schools~~ *Cancelled*

~~PAVANI RAM, University of Buffalo / USAID~~

How Does Intervention Fidelity Affect the Impact of a WaSH  
in Schools Intervention on Absence, Diarrhea, Respiratory  
Infection and Soil-Transmitted Helminths? Results from a  
Longitudinal Randomized-Controlled Trial in Laos

ANNA CHARD, Emory University

Beyond CHAST: Investing in School WaSH

SARAH AGUTI, The Water Trust

3:30 p.m.

## BREAK

4:00 p.m.

## VERBAL PRESENTATIONS

### WaSH IN SCHOOLS

#### Redbud

Costing and Financing the Operation and Maintenance of WaSH in Schools to Meet Targets under SDG 4 and 6

BELLA MONSE, GIZ

A Systematic Review of Costing and Financing of WaSH in Schools

SHANNON MCGINNIS, Temple University

Blue Schools: Linking WaSH in Schools with Other SDG 6 Targets

JOHN BROGAN, Terre des Hommes

### TOILETS

#### Dogwood

Utilizing Human Centered Design Methodologies to Retrofit an EcoSan Toilet in a Peri-Urban Community of Lusaka, Zambia

JASMINE BURTON, Wish for WaSH

Quality Construction and Appropriate Toilet Technologies: Learnings for Improving the Sanitation Mission in India

ANDRES HUESO, WaterAid

An Environmental Evaluation of Urine-Diverting Dry Toilets (UDDT) in Hiloweyn Camp, Dollo Ado, Ethiopia

TRAVIS BROWN, Centers for Disease Control and Prevention

### CLIMATE RESILIENCE

#### Bellflower

A Test of Ecological Sanitation as a Solution to Local Public Health and Global Climate Change Problems

REBECCA RYALS, University of Hawaii

A Comparative Sanitation Infrastructure Analysis Evaluating Resilience, Community Priorities and Sustainability Tradeoffs

KATHERINE CHAMBERS, University of Colorado

Intervention Pathways Towards Improving the Resilience of Pastoralists in Climate Vulnerable Communities of Ethiopia

ARGAW AMBELU, Jimma University

# DETAILED SCHEDULE

MONDAY OCT. 16 (cont.)

## HOUSEHOLD FILTRATION

### Mountain Laurel

Acceptability and Effectiveness of Household Membrane Filters Distributed in Internally Displaced Persons Settlements in South Sudan

DANIELE LANTAGNE, Tufts University

Assessment of Synthetic Hydroxyapatite (Fluorolith®) Filter Material for the Removal of Fluoride in Kenya

NANCY GITHUGO, Nakuru Defluoridation Company

Priorities of Emergency WaSH Practitioners when Selecting Household Water Filters

CANDICE YOUNG-ROJANSCHI, CAWST

## WaSH in EMERGENCIES

### Azalea

A Rapid Assessment of Municipal Water Systems Following Hurricane Matthew in Haiti, 2016

ANDREA MARTINSEN, Centers for Disease Control and Prevention

Water, Sanitation and Hygiene Access in Southern Syria: Analysis of Survey Data and Recommendations for Response

MUSTAFA SIKDER, Tufts University

5:00-6:30 p.m.

## POSTER RECEPTION

Atrium

## YOUNG PROFESSIONALS NETWORKING SESSION

Dogwood

6:00-7:00 p.m.

See *Special Event Descriptions*, p. 6.

7:30-8:30 a.m.

## WaSH POLICY RESEARCH DIGEST PANEL DISCUSSION

Wintergreen

See *Special Event Descriptions*, p. 7.

8:30 a.m.

\*NOTE: The Virtual Conference side event begins at **7:00 a.m.**

## SIDE EVENTS

### Annual Virtual Conference on Menstrual Hygiene Management in Schools\*

Convened by Columbia University Mailman School of Public Health, UNICEF

**Redbud**, continues after the break until 1:00 p.m.

### New Global SDG Baselines for Drinking Water, Sanitation and Hygiene

Convened by World Health Organization/UNICEF Joint Monitoring Programme

**Dogwood**, continues after the break

### Confronting the Elephant in the Room: How Do We Get from Increased Coverage to “Safely Managed” Sanitation?

Convened by PSI, Bill & Melinda Gates Foundation

**Sunflower**

### Results from the WaSH Benefits Trials of Water Quality, Sanitation, Handwashing and Nutritional Interventions in Bangladesh and Kenya

Convened by University of California, Berkeley; icddr,b; Innovations for Poverty Action; Stanford University; Tufts University

**Bellflower**, continues after the break

### Behavior Change at Scale: Bridging Research, Policy and Practice

Convened by WaterAid UK, London School of Hygiene and Tropical Medicine, World Bank

**Mountain Laurel**

### Routine Use of Multiple Household Water Sources

Convened by University of Alabama, Johns Hopkins University, Stanford University, University of Technology Sydney, The Water Institute

**HIGH INCOME COUNTRIES**

**Windflower**, continues after the break

### Choosing a Product that Works: Household Water Treatment and Safe Storage in Emergencies

Convened by World Health Organization, ELRHA Humanitarian Innovation Fund, CAWST

**Azalea**, continues after the break

# DETAILED SCHEDULE

TUESDAY OCT. 17 (cont.)

10:00 a.m. BREAK

## 10:30 a.m. SIDE EVENTS

*Programs in these rooms continue from the 8:30–10 session.*

**Redbud, Dogwood, Bellflower, Windflower, Azalea**

HEPI: Supporting WaSH Actors Get Ready for the Next Health Emergency

Convened by UNICEF

**Sunflower**

Theoretically Informed, Evidence-Based Intervention Design and Evaluation: Approaches and Lessons Learned from Three WaSH Behavior Change Studies in Ethiopia, Kenya and India

Convened by Emory University, London School of Hygiene and Tropical Medicine

**Mountain Laurel**

~~Knowledge to Practice: The Global Water Pathogen Project as a Resource for Quantitative Risk-Based Water and Sanitation Safety Planning~~ **Cancelled**

Convened by Global Water Pathogen Project

**Wintergreen**

12:00 p.m. **LUNCH**  
**Trillium Dining Room,**  
overflow seating in **Tent & Magnolia**

### **YOUNG PROFESSIONALS LUNCH & LEARN SERIES**

**Wintergreen**

12:15–1:00 p.m.

See *Special Event Descriptions*, p. 6.



1:00 p.m.

## PANEL

**Building Resilient Communities to Withstand Increasing Extreme Weather Events' Impact on the Global Water Crisis**

**Grumman Auditorium**

As global temperatures rise, evidence suggests that extreme weather events will affect populations worldwide, with the health of poor and marginalized communities disproportionately impacted. This panel will focus on linkages between environmental health and human health in the context of climate change and global urbanization, and explore what can be done to strengthen and build communities' water and sanitation systems to achieve SDGs 6.1 and 6.2.

Moderated by JOHN MATTHEWS, coordinator for the Alliance for Global Water Adaptation.

Panelists:

- PETER GLEICK, president emeritus of the Pacific Institute
- TONY WONG, chief executive of the Cooperative Research Centre for Water Sensitive Cities

2:00 p.m.

## THEME KEYNOTES

**Bill & Melinda Gates Foundation Investments in Sanitation: Influences & Inspirations**

**Dogwood**

BRIAN ARBOGAST, director of the Bill & Melinda Gates Foundation

**WaSH & Gender**

**Sunflower**

ARCHANA PATKAR, program manager for networking and knowledge management at the Water Supply and Sanitation Collaborative Council

## BREAK

2:30 p.m.

## VERBAL PRESENTATIONS

**WaSH & GENDER**

**Redbud**

**Women Sanitation Sales Agents in Cambodia: Barriers, Enablers and Potential Solutions**

JANITA BARTELL, WaterSHED

**The Last Taboo: Formative Research to Inform Menstrual Hygiene Management Interventions in the Pacific**

CHELSEA HUGGETT, WaterAid

**The Role of Gender in Community-Level Social Organization and Reduced Enteric Infection in Rural, Coastal Ecuador**

SONDIA HEGDE, University of Michigan

# DETAILED SCHEDULE

TUESDAY OCT. 17 (cont.)

## CLIMATE RESILIENCE

### Dogwood

Water Scarcity in the Middle East

MARIELLE SNEL, World Vision

The Economic Impacts of Large-Scale Water Infrastructure Improvements in Urban Zarqa, Jordan

MATEUSZ PUCILOWSKI, Social Impact

## WASTEWATER

### Bellflower

Decentralized Sanitation as a Solution to Growing Tourism in Coastal El Salvador

ADAM KEOUGH, Catholic Relief Services

Public Health Risks Associated with Unsafe Fecal Sludge Management in Accra, Ghana

HABIB YAKUBU, Emory University

Onsite Treatment and Reuse of Blackwater

BRIAN HAWKINS, RTI International

## LATRINES

### Mountain Laurel

Characterizing the Biodegradation of Faecal Sludge in Pour-Flush Pit Latrines in South Africa

FRANCIS DE LOS REYES, N.C. State University

Motivators and Barriers to Latrine Uptake in Rural Haiti

CANDICE YOUNG-ROJANSCHI, CAWST

Addressing the Barriers to Improve Latrine Use in Rural India

SHERIN DANIEL, World Vision India

## EVIDENCE TO ACTION

### Azalea

Data for Decision Making: Rural, Urban and Peri-Urban WaSH Baseline Surveys in the Solomon Islands

MAMITA THAKKAR, UNICEF

Concepts of Hygiene in Islamic Faith: Qualitative Findings from Muslim Communities in Sylhet, Bangladesh

FARZANA YEASMIN, icddr,b

Utilizing Data To Strategize Around the Challenge of Covering Long-Term Maintenance and Replacement Costs for Rural Community-Managed Projects

MICHAEL STAUB, Water Mission

3:30 p.m.

## BREAK

4:00 p.m.

## VERBAL PRESENTATIONS

### WaSH & GENDER

#### Redbud

Holistic Programming to Improve Girls' Education: USAID's ASPIRE Program in Malawi

SARAH BRAMLEY, Save the Children

Adverse Pregnancy Outcomes Associated with Household Water, Sanitation and Hygiene in Indonesia

CLAIRE CHASE, World Bank

### WaSH IN HEALTH CARE FACILITIES

#### Dogwood

Evaluation of Integration of Environmental Health Policies in Health Care Facilities in Malawi

RYAN MCCORD, University of North Carolina—Chapel Hill

Exposing Key Benefits and Challenges of Environmental Sanitation Interventions in Health Care Facilities in Ségou, Mali

LYDIA ABEBE, The Water Institute

Establishing a National Baseline for WaSH in Health Care Facilities (HCF): Contextualizing the Joint Monitoring Programme's WaSH in HCF Indicators

CHANNA SAM OL, WaterAid

# DETAILED SCHEDULE

TUESDAY OCT. 17 (cont.)

## ARSENIC EXPOSURE

### Bellflower

**Strong Heart Water Study: Designing a Multi-Level Participatory Intervention to Reduce Arsenic Exposure in American Indian Communities**

ELIZABETH THOMAS, Johns Hopkins

**Arsenic Primer 2.0: Updating a Resource**

RICK JOHNSTON, World Health Organization

~~**Piloting School-Led Arsenic Testing in Sherpur District, Bangladesh**~~ *Cancelled*

FIROJ ALAM, UNICEF

## HIGH INCOME COUNTRIES: WELLS

### Mountain Laurel

**The Impact of Septic Systems and Rainfall Events on Groundwater Quality in Private Wells in Rural Pennsylvania, USA**

HEATHER MURPHY, Temple University

**Examining Well Water Quality and Emergency Resource Needs after a Flooding Event**

ADRIENNE KATNER, Louisiana State University Health Sciences Center

**Racial Disparities in Access to Municipal Water Supplies in the American South: Impacts on Children's Health**

FRANK STILLO, University of North Carolina–Chapel Hill

## CHLORINATION

### Azalea

**Multi-Stakeholder Optimization Strategies for Household Chlorination Programs:**

**A Randomized Evaluation of the Impact of Bucket Subsidies and Household Visits**

MICHAEL RITTER, Tufts University

**Effect of Drinking Water Chlorination at the Point-of-Collection on Child Diarrhea in Dhaka, Bangladesh: A Double-Blind Cluster-Randomized Controlled Trial**

AMY PICKERING, Tufts University

**Improving Water Safety at the Household Level: Chlorine Dispensers in Ethiopia**

LAURA BRUNSON, Millennium Water Alliance

5:00-6:30 p.m.

## POSTER RECEPTION

Atrium



# Celebrating 10 Billion Liters of Clean Drinking Water



To learn more, visit [www.CSDW.org](http://www.CSDW.org)

# DETAILED SCHEDULE

## WEDNESDAY OCT. 18

8:30 a.m.

### SIDE EVENTS

#### WaSH in Emergency: How We Do It and What Do We Know About It?

Convened by Action Against Hunger, Office of U.S. Foreign Disaster Assistance (USAID/OFDA), UNICEF (Global WaSH Cluster), Civil and Environmental Engineering Department at Tufts University, Medentech, Global Communities

**Redbud**, continues after the break

#### Continuing to Address Waterborne Disease in the United States

Convened by Centers for Disease Control

**HIGH INCOME COUNTRIES**

**Dogwood**, continues after the break

#### Moving Beyond ODF; Measuring the Road Towards SDG 6.2

Convened by Water Supply and Sanitation Collaborative Council Global Sanitation Fund, IRC, University at Buffalo

**Sunflower**

#### Advancing Research Methods in Gender and WaSH: Sharing Lessons from Applied Field Experiences and Charting a Course for Future Work

Convened by Iris Group, Kathleen O'Reilly, Bethany Caruso

**Bellflower**, continues after the break

#### Behavior Change in Rural and Urban Sanitation

Convened by Eawag, Bill & Melinda Gates Foundation

**Mountain Laurel**

#### Sustainable WaSH Systems for Sustainable WaSH Services

Convened by University of Colorado–Boulder

**Windflower**

#### How Much is Spent on WaSH? Answering the Billion Dollar Question

Convened by World Health Organization, World Bank, Bill & Melinda Gates Foundation

**Azalea**

#### Exposure to Animal Feces and Human Health

Convened by Emory University, Public Health Institute, Stanford University, Tufts University

**Wintergreen**

10:00 a.m. **BREAK**

10:30 a.m. **SIDE EVENTS**

*Programs in these rooms continue from the 8:30–10 session.*

**Redbud, Dogwood, Bellflower**

**Swachh Bharat for Urban India: Toilets and Beyond**

Convened by CEPT University (India), RTI International USA

**Sunflower**

**WaSH Away from the Home: Possible or Pipe Dream for Dislocated Populations?**

Convened by World Vision, University of North Carolina–Chapel Hill

**Mountain Laurel**

**District-Based Initiatives for Achieving SDG 6: Experiences of Leveraging Partnerships and Building**

Convened by WaSH Local Government Systems in Ghana, Burkina Faso, Uganda, Ethiopia, Niger and Mali

IRC, Hilton Foundation

**Windflower**

**Financing WaSH: How to Increase Funds for the Sector While Reducing Inequities**

Convened by IRC, Water.org

**Azalea**

**From Evidence to Advocacy: Using Research to Drive Change**

Convened by Global Handwashing Partnership

**Wintergreen**

12:00 p.m. **LUNCH**

**Trillium Dining Room,**  
overflow seating in **Tent & Magnolia**

**YOUNG PROFESSIONALS  
LUNCH & LEARN SERIES**

**Wintergreen**

**12:15–1:00 p.m.**

*See Special Event Descriptions, p. 6.*

# DETAILED SCHEDULE

WEDNESDAY OCT. 18 (cont.)

1:00 p.m.

## PANEL

**Winning in the Field: Using Research to Fill Evidence Gaps and Contribute to Better Practice in WaSH**

**Redbud**

Collaboration between researchers and practitioners is hailed as an important hallmark of applied research. In practice, achieving successful collaboration is easier said than done. Furthermore, recent field-based WaSH research has provided a range of results, which do not always provide straightforward answers for practitioners looking to improve program implementation. How can researchers and practitioners improve partnership efforts, and design and implement rigorous implementation research that is relevant and immediately useful to practitioners?

Through this panel discussion, we aim to:

- Explore the relationship between WaSH practitioners and researchers by comparing the needs, perspectives and experiences of different stakeholders.
- Discuss examples of successful and unsuccessful collaboration and partnerships between WaSH researchers and practitioners, and share lessons learned.
- Identify factors that might enable/constrain the ability to conduct rigorous and relevant research.

Panelists:

**Researchers:**

- JACK COLFORD, University of California–Berkeley
- KATHLEEN O'REILLY, Texas A&M University
- OLLIE CUMMING, London School of Hygiene and Tropical Medicine

**Practitioners:**

- DARREN SAYWELL, AECOM
- SAMUEL DIARRA, World Vision
- JOHN BROGAN, Terre des Hommes

## THEME KEYNOTES

**Disparities in WaSH**

LAUREL FIRESTONE, co-founder and co-director of the Community Water Center

**Grumman Auditorium**

**WaSH in Non-Household Settings**

LOUNE VIAUD, co-executive director of Zanmi Lasante, Partner in Health's sister organization in Haiti

**Sunflower**



2:00 p.m. **BREAK**

2:30 p.m. **VERBAL PRESENTATIONS**

#### **RURAL DRINKING WATER**

##### **Redbud**

**Rural Agriculture and Drinking Water Safety in Northern Ghana: Practices, risks, and Seasonal Trends Revealed Through Household Sampling and Long-Term Water Source Monitoring**

JOHN TRIMMER, University of Illinois at Urbana-Champaign

**Rethinking Tap Water in Rural Communities: A Hybrid Centralized-POU Drinking Water Treatment System in Chiapas, Mexico**

SIMON MOSTAFA, Fundacion Cantaro Azul

**More Than Drinking Fountains: An Integral Approach to Increasing Access and Sustainability of Safe Drinking Water Services in Rural Schools**

FERMIN REYGADAS, Fundacion Cantaro Azul

#### **HIGH INCOME COUNTRIES: GOVERNANCE & REGULATION**

##### **Dogwood**

**Risk Governance of Emerging Contaminants in Drinking Water Resources: Analyzing Practices in the Netherlands, Germany, Switzerland and the State of Minnesota**

JULIA HARTMANN, National Institute for Public Health and the Environment

**Sanitation and LGBTI: Review of Issues Faced and Efforts to Overcome Them**

ANDRES HUESO, WaterAid

**Public Drinking Water System Coverage and Its Discontents: The Prevalence of and Severity of Water Access Problems in California's Mobile Home Parks**

GREGORY PIERCE, UCLA Luskin Center

# DETAILED SCHEDULE

WEDNESDAY OCT. 18 (cont.)

## MATERNAL CHILD HEALTH

### Bellflower

Improving Hygiene during the Perinatal Period: Assessing the Evidence and Groundtruthing in Nigeria

ROBERT DREIBELBIS, London School of Hygiene and Tropical Medicine

Assessing Environmental Contamination in the Maternity Wards of Two National Hospitals in Phnom Penh, Cambodia

XINYUE WANG, Emory University

Effect of Social Capital, Harassment of Women and Girls, and Water and Sanitation Access on Risk of Premature Birth and Low Birth Weight Infancy Between 2005 and 2011 in Indian Women

KELLY BAKER, University of Iowa

## ASSESSING DISPARITIES

### Mountain Laurel

Urban Health and Disparities: A Comparison of 57 Cities

CHRISTINE STAUBER, Georgia State University

Commonalities in Sanitation Issues in High and Low Income Countries

SUSAN MERTHER, WEFTEC

Assessing Conflict in Water Resources Projects

CHRIS SEREMET, Catholic Relief Services

## NON-HOUSEHOLD WaSH

### Azalea

WaSH Facility Evaluation Tool (FACET) for Health Facilities and Schools

JOHN BROGAN, Terre des Hommes

WaSH in Non-Household Settings: Learnings for Scaling up WaSH in Schools

ANJAN SARKAR, Splash International

Can Autonomous Production of Sodium Hypochlorite in Health Facilities Resolve Disinfectant Cost and Quality Issues in Rural and Peri-Urban Health Facilities? Evidence from Zambia

GREGOIRE CASTELLA, Antenna Foundation

3:30 p.m.

**BREAK**

4:00 p.m.

## **VERBAL PRESENTATIONS**

### **SUSTAINABLE SYSTEMS**

#### **Redbud**

Identifying Opportunities to Improve Piped Water Continuity in Honduras, Nicaragua and Panama Using Bayesian Networks and Regression

RYAN CRONK, The Water Institute

Sustainability of USAID WA-WaSH Drinking Water Investment in West Africa

LAHKDAR BOUKERROU, Florida International University

Leveling the Playing Field: Thinking and Working Differently to Reach the Poor

LUIS ANDRES, World Bank

### **HIGH INCOME COUNTRIES: BURDEN OF DISEASE**

#### **Dogwood**

Epidemiologic Investigation of Municipal Drinking Water Treatment Practices and Nontuberculous Mycobacterial Infection

NADINE KOTLARZ, University of Michigan

Epidemiological Evidence of Groundwater Contribution to Global Enteric Disease, 1948–2015

HEATHER MURPHY, Temple University

An Advanced Legionellosis Risk Model Accounting for Epidemiological Evidence of Disease Burden

MARK WEIR, Ohio State University

### **LEARNING FROM FAILURE & SUCCESS**

#### **Bellflower**

Marks of Failed and Successful Mechanized Borehole Systems: The Case of the Sinazongwe ADP

EMANUEL OPONG, World Vision International

The Swiss Cheese Failure Mode of Self-Supply Hand-Dug Wells in a Developing Nation: Review and Implications for Water Safety Planning

GRACE OLUWASANYA, Federal University of Agriculture, Abeokuta, Nigeria

Avoiding Failure: The Use of Qualitative Comparative Analysis to Identify Pathways to Successful Sanitation Interventions

ALLIE DAVIS, University of Colorado–Boulder

# DETAILED SCHEDULE

WEDNESDAY OCT. 18 (cont.)

## WATER QUALITY & MONITORING

### Mountain Laurel

Impact Evaluation of Large-Scale WaSH Infrastructure Improvement Project: Baseline Water Quality Testing Results

LAUREN CUNNINGHAM, Centers for Disease Control and Prevention

How Much Will It Cost to Monitor Microbial Drinking Water Quality in Sub-Saharan Africa?

CAROLINE DELAIRE, Aquaya Institute

Evaluation of a Low-Cost Compartment Bag Test to Quantify Hydrogen Sulfide Producing Bacteria in Drinking Water

CLAIRE TIPTON, The Water Institute

### Azalea

Integrated WaSH and Community Based Nutrition (CBN) Programs: Insights from a Five-Year UNICEF Program in Ethiopia

JANE BEVAN, UNICEF Ethiopia

Improving Water, Sanitation and Hygiene in Health Care Facilities in Mali: Results of a Multi-Sectoral Collaboration

SAE-ROM CHAE, Centers for Disease Control and Prevention

Community Engagement for Sustainable Community Managed Water Systems: Qualitative Evidence from Rural Ghana, Kenya and Zambia

NIKKI BEHNKE, The Water Institute

5:00-6:30 p.m.

## POSTER RECEPTION

Atrium

6:30-8:30 p.m.

## CONFERENCE DINNER

Trillium Dining Room

### PHOTOBOOTH

Trillium Dining Room

Sponsored by **Watermill Express**

See *Special Event Descriptions*, p. 7.

8:30 a.m.

## SIDE EVENTS

Improving the Management and Sustainability of Small Water Supplies: Guidelines on Small Water Supplies

Convened by World Health Organization

**Redbud**, continues after the break

Ensuring Drinking Water Affordability: Challenges and Opportunities in Current Policy Making at Local, State and National Levels

Convened by UCLA Luskin Center, UNC Environmental Finance Center

**HIGH INCOME COUNTRIES**

**Dogwood**

Potential of Pathogen Hazard Tracking for Sanitation Planning

Convened by The Water Institute

**Sunflower**

The Business Case for Women in WaSH

Convened by iDE, PSI, Water.org

**Bellflower**

Global Health Security Agenda (GHSA) Enteric Disease Outbreak Response Capacity Building Toolkit

Convened by Centers for Disease Control

**Mountain Laurel**, continues after the break

Moving WaSH in Health Care Facilities from Assessment to Action: What are the Solutions?

Convened by The Center for Global Safe WaSH at Emory University

**Windflower**, continues after the break

SWA: What are We Learning from Engaging Finance and Sector Ministers in High-Level Sector Dialogues?

Convened by Sanitation and Water for All

**Azalea**, continues after the break

Something to Squawk About: A Fresh Look at the F Diagram and Neglected Pathways Impacting Child Growth

Convened by World Vision, WaterSHED

**Wintergreen**

10:00 a.m.

## BREAK

# DETAILED SCHEDULE

THURSDAY OCT. 19 (cont.)

10:30 a.m.

## SIDE EVENTS

*Programs in these rooms continue from the 8:30–10 session.*

**Redbud, Mountain Laurel, Windflower, Azalea**

**Addressing WaSH Needs Within the Transgender Community**

Convened by Water Supply and Sanitation Collaborative Council, World Health Organization, The Water Institute

**Dogwood**

**WaSH for Vulnerable Populations in Peri-Urban Areas**

Convened by London School of Hygiene and Tropical Medicine, SHARE Research Consortium

**Sunflower**

**Launch and Learn: Sharing New Evidence and Guidance on Menstrual Hygiene Management in Humanitarian Response**

Convened by Columbia University, International Rescue Committee

**Bellflower**

**Sector Reform Processes for Strengthening WaSH Systems in Ghana and Uganda**

Convened by IRC

**Wintergreen**

12:00 p.m.

## LUNCH

**Trillium Dining Room,**  
overflow seating in **Tent & Magnolia**

### YOUNG PROFESSIONALS LUNCH & LEARN SERIES

**Wintergreen**

12:15–1:00 p.m.

See *Special Event Descriptions*, p. 6.

1:00 p.m.

## PANEL

Merging Science and Technology with  
Culture and Tradition

### Grumman Auditorium

This panel will focus on how to ensure that Native American Tribal culture, traditions and past experiences are considered and reflected in efforts to provide access to drinking water and sanitation services. It brings together operators, researchers and public health practitioners to discuss how these factors influence the acceptance and success of services, lessons learned from a sample of experiences and opportunities to ensure this becomes the norm, not the exception.

Panelists include:

- JOHN DOYLE, Little Bighorn College
- MARI EGGERS, Montana State University Bozeman
- JAMES TEMTE, National Tribal Water Center
- STEVE TERRY, United South & Eastern Tribes

## THEME KEYNOTES

Evidence to Action

RICK GELTING, Centers for Disease Control and Prevention, 2013 Federal Engineer of the Year

DAVID GUTE, professor of civil and environmental engineering at Tufts University

### Sunflower

TBD

CATARINA DE ALBUQUERQUE, executive chair of the Sanitation and Water for All Partnership

### Redbud

~~Sanitation~~ *Cancelled*

~~DENNIS MWANZA, deputy director of Urban Sanitation Markets~~

### Redbud

2:00 p.m.

## BREAK

# DETAILED SCHEDULE

THURSDAY OCT. 19 (cont.)

2:30 p.m.

## VERBAL PRESENTATIONS

### Redbud

**One Size Fits Most: Assessing the Compatibility of Ethidium Monoazide and Propidium Monoazide Pretreatment with Two Widely Used Human Adenovirus qPCR Protocols to Estimate Viral Infectivity**

MATS LEIFELS, University of Alberta

**Evaluation of an Emergency Bulk Chlorination Program Targeting Drinking Water Vendors in Cholera-Affected Wards of Dar es Salaam and Morogoro, Tanzania**

ANANGU RAJASINGHAM, Centers for Disease Control and Prevention

**A Systematic Review and Meta-analysis of Water, Sanitation and Hygiene Exposures in Cholera Case-Control Studies**

MARLENE WOLFE, Tufts University

### HIGH INCOME COUNTRIES: TRIBAL LANDS

### Dogwood

**Unfinished Business: Water, Sanitation and Hygiene in Remote Indigenous Communities in Australia's Northern Territory**

TIM FOSTER, University of Technology Sydney

**Relocatable Sanitation Systems for Climate Displaced Communities**

JENNIFER MARLOW, Re-Locate LLC

**Missing School in Australia Due to Gaps in Menstrual Health Management**

NINA HALL, University of Queensland



## RURAL PIPED WATER

### Bellflower

Drinking Water Quality, Diarrhea and Enteropathogen Infections in Peruvian Households with Infants

MIRANDA DELAHOY, Emory University

Effects of a Piped Water and Sanitation Intervention in Rural Odisha, India, on Child Dietary

Diversity: A Matched Cohort Study

SHEELA SINHARROY, Emory University

Effectiveness of a Combined Household-Level Piped Water and Sanitation Intervention in Rural

Odisha, India, on Diarrhea, Respiratory Infection, Soil-Transmitted Helminth Infection and

Nutritional Outcomes: A Matched Cohort Study

HEATHER REESE, Emory University

## WATER REUSE

### Mountain Laurel

Impact of Different Irrigation Systems on Domestic Drinking Water Quality in Peri-Urban Areas of

Gujarat, India

RUCHI VANGANI, IIPHG

User Perspectives on Water Reuse: Insights from Urban India

MYLES ELLEDGE, RTI International

Understanding Sources of Contamination in Stormwater Ponds to Promote Water Reuse in Alberta

MEGAN BEAUDRY, University of Alberta

## DEVELOPMENT GOALS

### Azalea

Progress on the Sanitation Ladder: Looking back at the MDGs and Projecting to 2030

MARK ELLIOTT, University of Alabama

Research Priorities under Sustainable Development Goal 6 and Research and Learning Challenges

among Global Partners of Sanitation and Water for All

KAREN SETTY, The Water Institute

Sanitation Progress Index: Measuring Progressive Realisation of SDG 6

STUART KEMPSTER, WaterAid

3:30 p.m.

**BREAK**

# DETAILED SCHEDULE

THURSDAY OCT. 19 (cont.)

4:00 p.m.

## VERBAL PRESENTATIONS

### HANDWASHING

#### Redbud

Effectively Promoting Handwashing Frequency Through Improving Technique: A Cluster-Randomized Trial in Rural Zimbabwe

JENNIFER INAUEN, Eawag

Applied Research on Disinfection of Surfaces and Hands to Prevent Ongoing Transmission of Ebola

DANIELE LANTAGNE, Tufts University

Comparison of Analytical Techniques to Explain Variability in Stored Drinking Water Quality and Microbial Hand Contamination of Female Caregivers in Tanzania

ANGELA HARRIS, Stanford University

### HIGH INCOME COUNTRIES: INTERVENTIONS

#### Dogwood

Who Drinks the Tap Water? Disparities in Tap and Bottled Water Consumption among U.S. Adults, 2011-2014

ASHER ROSINGER, Pennsylvania State University

Examining the Effectiveness of Household Water Lead Remediation Strategies during the Flint Water Crisis

KELSEY PIEPER, Virginia Tech

Contamination, Detection and Perception: Classifying and Correcting Drinking Water Quality Parameters of Concern Post-Flint

GREGORY PIERCE, UCLA Luskin Center

## WATER SERVICE & DELIVERY

### Bellflower

Sustainability Assessment of Rural Water Service Delivery Models: Findings of a Multi-Country Review

LUIS ANDRES, World Bank

What Does It Take to Have a Fully Functional Service Authority? Evidence from Honduras

ANDRES GIL, IRC

Water Supply and Sanitation Service Provision in Urban Slums of Dhaka, Bangladesh

SABRINA HAQUE, World Bank

## HOUSEHOLD WATER TREATMENT

### Mountain Laurel

Can Bulking Agent Types Influence *Ascaris* Eggs Inactivation Efficiency during Faecal Sludge Treatment via Co-composting?

MUSA MANGA, The Water Institute

A Landlord's Journey to Improved Sanitation: Compound Sanitation in Cote D'Ivoire

JOHN SAUER, PSI

A Case for Pit Latrines: A Conceptual Model of Pathogen-Specific Hazards Over Time

LISA FLEMING, The Water Institute

## TREATMENT

### Azalea

Effectiveness Evaluation of a Two-Step Water Filter Using Flocculation and Bio-filtration in Rural Dominican Republic

NIKHIL PATIL, Tufts University

Effects of a Behavior Change Campaign on Household Drinking Water Disinfection in the Lake Chad Basin Using the RANAS Approach

HANS-JOACHIM MOSLER, Eawag

Effects of a Large-Scale Distribution of Water Filters on Water Quality and Diarrhea: A Cluster Randomized Controlled Trial in Western Province, Rwanda

MILES KIRBY, Emory University

5:00-6:30 p.m.

## POSTER RECEPTION

Atrium

# DETAILED SCHEDULE

## FRIDAY OCT. 20

8:30 a.m.

### SIDE EVENTS

Latin America and the Caribbean  
Framework for Safe Drinking Water  
Convened by Pan American Health  
Organization  
**Dogwood**

### INTERNATIONAL PROJECT MANAGEMENT WORKSHOP

**Mountain Laurel**

9:00 a.m.-4:00 p.m.

*See Special Event Descriptions, p. 7.*

Calling All WaSH Experts: Tools and Case Studies for Multi-Sectoral Actions  
Convened by The BabyWaSH Coalition, World Vision  
**Sunflower**

A Journey of Gender Mainstreaming in WaSH: From Evidence to Gender Intentional and  
Transformative Programming

Convened by Bill & Melinda Gates Foundation, WaterAid, Emory University, London School of  
Hygiene and Tropical Medicine  
**Bellflower**, continues after the break

Biosand Filter Updates: Implementer Support Tools, Research and Inquiry  
Convened by Lehigh University, Centre for Affordable Water and Sanitation Technology, Pure Water  
for the World  
**Windflower**, continues after the break

Walking the Talk: How Programs are Embodying the SWA Collaborative Behaviors  
Convened by SWA, Agenda for Change  
**Azalea**

Ceramic Pot Filters: Current Research, Future Directions and Defining Next Steps  
Convened by Ceramics Manufacturing Working Group, Tufts University  
**Wintergreen**, continues after the break

10:00 a.m.

### BREAK

10:30 a.m.

## SIDE EVENTS

*Programs in these rooms continue from the 8:30–10 session.*

**Bellflower, Windflower, Wintergreen**

**Knowledge Management and Translating Evidence to Action: A Case for Context Specificity**

Convened by WaterSHED, WaterAid

**Redbud**

**Does Evidence Even Matter? CSO Strategies for Ensuring It Does**

Convened by iDE, SNV, East Meets West Foundation

**Dogwood**

**Amplifying Impact: The Case for Advocacy and Ways to Measure It**

Convened by IRC, Simavi, Akvo, Water.org

**Sunflower**

**Can New Technologies Support Water Quality Management in Rural, Low Resource Settings?**

Convened by University of Oxford

**Azalea**

12:00 p.m.

## LUNCH

**Trillium Dining Room,**  
overflow seating in **Tent &**  
**Magnolia**

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# FEATURED SPEAKERS

## BRIAN ARBOGAST

**PLENARY PANEL** Understanding Baselines, Indicators and Hurdles to Achieving the SDGs

**THEME KEYNOTE** Bill & Melinda Gates Foundation Investments in Sanitation: Influences & Inspirations



**Brian Arbogast** leads the Bill & Melinda Gates Foundation's effort to bring groundbreaking innovations in sanitation technology and new ways to deliver sanitation products and services to people in the developing world.

Arbogast was previously a corporate vice president at Microsoft, leading an international portfolio of research and development projects. More recently, he concentrated in cleantech and international development, driving market solutions to address some of the world's most pressing challenges. He served as a senior advisor with The Boston Consulting Group and as a board member of the Northwest Energy Angels and of Water1st International. He is a founding board member of Progress Alliance of Washington and an advisor to Upaya Social Ventures. Arbogast received his bachelor's of mathematics in computer science from the University of Waterloo, Canada, and a certificate in sustainable business from the Bainbridge Graduate Institute.

## CATARINA DE ALBUQUERQUE

**PLENARY PANEL** Understanding Baselines, Indicators and Hurdles to Achieving the SDGs

**THEME KEYNOTE** TBD



**Catarina de Albuquerque**, executive chair of Sanitation and Water for All (SWA), joined SWA in 2014 and her priorities include advocating for a pivotal role for SWA within the SDGs, political prioritization of WaSH at a global high-level, helping build consensus between partners, establishing strategic partnerships with other initiatives and sectors and leading SWA's Steering Committee.

Previously, she was the first UN Special Rapporteur on the right to safe drinking water and sanitation. Between 2004 and 2008 she presided over the negotiations of the Optional Protocol to the International Covenant on Economic, Social and Cultural Rights, which the UN General Assembly approved by consensus on 10 December 2008.

De Albuquerque is an invited professor at the law faculties of the Universities of Braga and Coimbra (Portugal) and a senior legal adviser at the Office for Documentation and Comparative Law, an independent institution under the Portuguese Prosecutor General's Office. She was awarded the Human Rights Golden Medal by the Portuguese Parliament (10 December 2009) for outstanding work in the area of human rights. Her work in human rights was also honoured by the Portuguese President of the Republic (October 2009) with the Order of Merit, which is a recognition of an individual's personal bravery, achievement, or service. She holds a law degree from the University of Lisbon (Portugal) and a DES from the Institut Universitaire de Hautes Etudes Internationales (Geneva, Switzerland).

## JOHN DOYLE

**PANEL** Merging Science and Technology with Culture and Tradition



**John Doyle**, a Crow Tribal member, was born, raised and has always lived on the Crow Reservation. He has worked on local water and health issues for ~35 years, including 24 years as a county commissioner and member of the Board of Health, 15+ years as co-founder and director of the tribe's Water and Wastewater Authority, 10+ years as co-founder and member of the Crow Environmental Health Steering Committee (CEHSC) and three years as Little Big Horn College's PI of the Crow Water Quality Project. John serves as the primary community researcher for the CEHSC's work to understand, communicate and mitigate contamination of rivers, springs and home wells as well as address climate impacts related to these water sources. He actively mentors Crow graduate and undergraduate students who intern with the CEHSC's community-engaged research projects, participates in water and health activities with local K-12 students and does extensive outreach—explaining and discussing water and health issues with tribal members throughout the reservation. He is a co- or lead author of six peer-reviewed publications on Crow water and health.

## MARI EGGERS

### PANEL Merging Science and Technology with Culture and Tradition



**Mari Eggers** has focused on community engaged environmental health research, teaching and student mentoring for 20+ years. She initially taught science at Little Big Horn College on the Crow Reservation. In 2005, with tribal colleagues, she co-founded the Crow Environmental Health Steering Committee (CEHSC) to research and address reservation surface and groundwater quality, health and climate issues. Eggers serves as the primary academic partner for the CEHSC. Having lived for many years on the Crow Reservation in a typical home with virtually unusable well water, she understands what that means to people's daily lives and is committed to helping families find workable and affordable solutions. Her education includes a post-doc and doctorate in environmental health and a master's in ecology from Montana State University Bozeman, as well as master's and bachelor's degrees in biological anthropology from Stanford University.

## LAUREL FIRESTONE

### THEME KEYNOTE Disparities in WaSH



**Laurel Firestone** co-founded and co-directs the Community Water Center. In January 2016, she was listed as one of nine most influential people in California water policy by Environment & Energy Publishing. Firestone has received a variety of awards and recognitions, including the Gary Bellow Public Service Award by the Harvard Law School in 2013, and is regularly asked to testify and speak on a variety of water equity topics. She served on the Tulare County Water Commission from 2007 to 2012 and co-chaired the Governor's Drinking Water Stakeholder Group from 2012 to 2014. She continues to serve on a variety of state policy advisory committees, as well as partner with universities to develop research and clinical programs to ensure the human right to water. In 2009, Firestone authored the comprehensive *Guide to Community Drinking Water Advocacy* and continues to author both scholarly and practical publications related to equitable, transparent and effective water policy topics.

Firestone graduated with honors from Harvard Law School and holds a bachelor's in environmental studies, magna cum laude, from Brown University.

## RICK GELTING

### THEME KEYNOTE Evidence to Action



**Rick Gelting** has worked for the Centers for Disease Control and Prevention for over 15 years on water, sanitation and hygiene, recently with a special focus on these issues in Haiti. He has done research and provided technical assistance on issues related to the sustainability and health impact of WaSH interventions and has been closely involved in implementing and evaluating Water Safety Plans in Latin America and the Caribbean. Gelting has also been involved in environmental investigations related to numerous waterborne disease outbreaks, both in the United States and other countries. He holds master's and doctoral degrees in environmental engineering from Stanford University, is a registered professional engineer and was the 2013 Federal Engineer of the Year in the United States. Beyond his work with the CDC, Gelting is also an adjunct professor of global health for Emory University.



## PETER GLEICK

### PANEL Building Resilient Communities to Withstand Increasing Extreme Weather Events' Impact on the Global Water Crisis



**Peter Gleick** is a world-renowned expert, innovator and communicator on water and climate issues. In 1987 he co-founded the Pacific Institute, which he led as president until mid-2016, when he became president emeritus and chief scientist

Gleick developed one of the first analyses of climate change impacts on water resources, the earliest comprehensive work on water and conflict, and defined the basic human need and right to water—work that has been used by the United Nations and in human rights court cases. Also, he pioneered and advanced the concepts of the “soft path for water” and “peak water.”

Gleick received the prestigious MacArthur “Genius” Fellowship and was elected to the U.S. National Academy of Sciences. He serves on the boards of numerous journals and organizations and is the author or co-author of many scientific papers and 11 books. Gleick holds a bachelor’s degree from Yale University and master’s and doctorate degrees from the University of California, Berkeley.

## DAVID GUTE

### THEME KEYNOTE Evidence to Action



**David M. Gute** is a professor of civil and environmental engineering at Tufts University. He holds a joint appointment with the Department of Public Health and Community Medicine at the Tufts University School of Medicine as well as at the Gerald J. and Dorothy R. Friedman School of Nutrition Science and Policy. He directs a master’s/doctoral program in environmental health and has served as the academic director of the Tufts in Talloires program located in the Haute Savoie, France.

Prior to joining the Tufts faculty, Gute served as an assistant commissioner responsible for personal and environmental disease risk factor reductions with the Massachusetts Department of Public Health and as an epidemiologist with the Rhode Island Department of Health. He has served as a consultant for a number of organizations, including the World Health Organization and AcademyHealth. He is interested and committed to offering environmental and public health training in a variety of settings including international venues, having led and co-directed training programs in Brazil and the Philippines. Gute received his master’s and doctoral degrees from Yale University. He is a fellow of the American College of Epidemiology.

## PARAM IYER

### PLENARY PANEL Understanding Baselines, Indicators and Hurdles to Achieving the SDGs



**Parameswaran Iyer** is the Secretary, Ministry of Drinking Water and Sanitation (MDWS), Government of India. MDWS is the nodal Ministry for the country’s national sanitation flagship program, the Swachh Bharat Mission, which is implementing the largest behaviour change program in the world, seeking to motivate about 550 million Indians in rural India to stop defecating in the open. The MDWS also manages the National Rural Drinking Water Program. Iyer has more than 20 years of experience in the Water and Sanitation sector, of which 14 years were spent with the World Bank, where he worked in many countries, including Vietnam, China, Egypt and Lebanon. In his last World Bank assignment, he managed the Global Water Practice’s South Asia Water program. Earlier, while working in the Government of Uttar Pradesh, India, from 1994 to 1998, he led the Swajal Rural Water and Sanitation project, pioneering a demand-responsive and community led approach, which led to sector reforms at the national level.



## RICK JOHNSTON

### PLENARY PANEL Understanding Baselines, Indicators and Hurdles to Achieving the SDGs



**Rick Johnston** leads the World Health Organization (WHO) half of the WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation, which monitors water, sanitation and hygiene at global, regional and country levels. Prior to joining WHO in 2013 he worked at Eawag: the Swiss Federal Institute of Aquatic Science and Technology, and at UNICEF. He has over 20 years of experience on WaSH in low- and middle-income countries, with a focus on monitoring and drinking water quality. He holds degrees in environmental engineering from the Johns Hopkins University and the University of North Carolina–Chapel Hill.

## JOHN H. MATTHEWS

### PANEL Building Resilient Communities to Withstand Increasing Extreme Weather Events' Impact on the Global Water Crisis, *Moderator*



**John H. Matthews** is the coordinator for the Alliance for Global Water Adaptation. His work integrates climate change adaptation policy and science into sustainable natural resource management, infrastructure operations and economic development. Matthews has worked on five continents and some 25 countries. He has authored or co-authored recent books, papers and reports on decision-making frameworks for adapting water infrastructure and ecosystems to climate impacts, resilient approaches to environmental flows, integrating ecological and engineering approaches to robust water management, and using new economic tools to support long-term sustainable planning. He has an ongoing research program on climate adaptation strategies for resource management in the North American Great Basin, funded by the USGS as well as a U.S. NSF grant to merge ecological and engineering approaches to long-term sustainable water management and water infrastructure. He is a senior water fellow at Colorado State University.

Previously, Matthews directed the global WWF freshwater climate adaptation program and the Freshwater Climate Change program at Conservation International for four years each. He has a doctorate in ecology from the University of Texas and held a postdoctoral research position in conservation biology with the U.S. Geological Survey. His undergraduate degree is in cultural anthropology, and he worked as a book editor in the publishing industry for 12 years.

## WRO FRENESH MEKURIA

### PLENARY PANEL Understanding Baselines, Indicators and Hurdles to Achieving the SDGs



Her Excellency **Wro Frenesh Mekuria** is state minister for the Ethiopian Ministry of Water, Irrigation and Electric as well as vice chairperson of Ethiopia's National WaSH Steering Committee. Prior to that, she was state minister of Agriculture & Natural Resources as well as state minister of Women's, Children's and Youth Affairs. Since the start of her professional career she has accumulated experience in gender and youth mainstreaming, natural resources and agriculture projects, water supply and sanitation projects, and sustainable irrigation system.

Before becoming a state minister, she was a deputy bureau head and managed and kept close follow up of different kind of large and small scale of natural resource projects, such as conservation and use of forest and wildlife resources, food security, water use and small-scale irrigation, monitoring and early warning systems for events affecting agricultural development, and establishing and providing agriculture and rural technology training.

Mekuria has also organized and led teams of government experts and planners, community leaders, promoters and technicians in knowledge exchange in development and emergency response areas; and promoted improved knowledge management in areas ranging from planning, management, monitoring and evaluation, gender, community and uniform costing and tariff systems, peri-urban water supply and community organization, municipal and district planning, community participation, water resource management and environment, appropriate technologies, public-private partnerships development and preparation of international agreements.

## DENNIS MWANZA

THEME KEYNOTE Sanitation *Cancelled*



**Dennis Mwanza**, deputy director of Urban Sanitation Markets, works with national governments, city administrations, and development partners in promoting city-wide inclusive sanitation, financing and public private partnerships to promote access and use of sanitation facilities, especially by the urban poor.

Prior to joining the foundation in September 2016, Mwanza was previously with the USAID-funded regional program Sustainable Water and Sanitation in Africa, concentrating on innovative financing for utility infrastructure, policy and regulatory reforms, and urban sanitation. He also worked at the World Bank and as a consultant to the African Development Bank, developing country water and sanitation sector review reports in Mozambique, Botswana and Tanzania.

Mwanza has more than 20 years' experience as a water and sanitation specialist in developing countries. He holds a PhD in economic regulation of urban water and sanitation services, master's and bachelor's degrees in civil engineering, and a technician's diploma in water engineering from Zambia.

## ARCHANA PATKAR

THEME KEYNOTE WaSH & Gender



**Archana Patkar** is the program manager for networking and knowledge management at the Water Supply and Sanitation Collaborative Council (WSSCC). WSSCC's mission is to ensure sustainable sanitation, better hygiene and safe drinking water for all people in the world.

A native of Mumbai, India, Patkar is a leading development specialist and sanitation, hygiene and water supply expert. Her particular areas of expertise include health, education, water and sanitation, and gender and women's rights in rural and urban contexts. She knows these issues intimately and, in particular, how they impact each other. For example, her long association with the water and sanitation sector began rather accidentally through an assignment in the education sector wherein poor sanitation for girls turned out to be the root cause of absenteeism and drop out.

At WSSCC, since 2010, she has helped steering the organization's redevelopment as a sector leader in topics such as equity and inclusion in sanitation and hygiene, menstrual hygiene management and sanitation as a business. She played a key authorship role in developing the organization's new strategic work plan for 2012 to 2016, which includes indicators for measuring WSSCC's impact in the years to come. She was the task force chair for the 2011 Global Forum on Sanitation and Hygiene, and among her many honorary positions she is on the global board of directors for the Freshwater Action Network-South Asia. She also served on the organizing committee for path-breaking sector events such as the South Asian Conference on Sanitation and contributed to the development of related reports and monitoring mechanisms that held governments to account for their commitments on water and sanitation, and which gave voice to civil society.

Before joining WSSCC, Patkar worked intensively on the design and monitoring and evaluation systems of several large water and sanitation programs for WaterAid, DFID, UNICEF and the government in Asia and Africa. She also helped found Junction Social, a development consulting firm offering advisory services in social development across sectors.

## TOM SLAYMAKER

### PLENARY PANEL Understanding Baselines, Indicators and Hurdles to Achieving the SDGs



**Tom Slaymaker** is a senior statistics and monitoring specialist (WaSH) in the Data and Analytics Section at UNICEF and has nearly 20 years of experience working on drinking water, sanitation and hygiene in Africa and Asia.

He currently manages the World Health Organization/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP) and coordinates UNICEF's technical inputs to the Inter-Agency and Expert Group responsible for developing indicators for global monitoring of the Sustainable Development Goals.

## JAMES TEMTE

### PANEL Merging Science and Technology with Culture and Tradition



**James Temte** is a member of the Northern Cheyenne Tribe and grew up in the Rocky Mountains living in Wyoming and Colorado. He joined the National Tribal Water Center (NTWC) in 2014 and now serves as the director of the NTWC.

Temte has served as the director of the Alaska Tribal Conference on Environmental Management, the vice chair of the National Tribal Air Association and on the Board of Directors of the Climate Registry. His interest in water and sanitation work focuses on human health, including affordable access to adequate and sustainable water and sanitation services. He loves to work with communities on multi-disciplinary teams to incorporate innovative health education techniques to inspire positive actions.

Temte received his undergraduate degree in molecular biology with a minor in chemistry from Fort Lewis College and his master's in applied environmental science and technology from the University of Alaska—Anchorage.

## STEVE TERRY

### PANEL Merging Science and Technology with Culture and Tradition



**Steve Terry** has worked with tribes and federal and state agencies for more than 32 years. He has been involved with tribal drinking water and wastewater facilities for more than 25 years. He currently is a senior project manager with the United South & Eastern Tribes (USET) and assists the USET Certification Board for Water and Wastewater Treatment Plant Operators and Laboratory Analysts by overseeing applications for certification by the USET Operator Certification Program. He has served on the USET Peer Review team for sanitary surveys of tribal drinking water systems. Through his efforts, USET became an EPA approved provider for drinking water certification for Indian tribes nationwide.

For more than 25 years, Terry was the land resources manager for the Miccosukee Tribe of Indians of Florida, where he administered the Real Estate Services Department and oversaw EPA and other grants. He has received numerous awards and attended many conferences and training sessions. The major awards he has received includes the Michal A. Frost Award from the National Tribal Environmental Council for environmental leadership, the National Partnership for Reinventing Government from Vice-President Al Gore for the Peer Review Team, and Honors from Harvard University's Honoring Contributions in the Governance of American Indian Nations for the Miccosukee Section 404 Permitting Program.

After earning his bachelor's degree from Texas A&M University, Terry worked as a research biologist for the University of Florida's School of Forest Resources & Conservation for 11 years, doing research studies and assisting in publishing the results with 30 papers and presentations to his credit. He has a master's degree from the University of Florida.

## LOUNE VIAUD

### THEME KEYNOTE WaSH in Non-Household Settings



**Loune Viaud** was born in Port-Salut, Haiti. Currently she serves as the co-executive director of Zanmi Lasante, Partner in Health's sister organization in Haiti. She works to provide health care and social services to the country's poorest communities throughout the Central Plateau and Lower Artibonite regions. Started as a small clinic for a squatter settlement in Central Haiti, Zanmi Lasante now operates Central Haiti's largest hospital and a dozen outpatient clinics. Under Viaud's leadership, Zanmi Lasante has grown to become the largest non-government health care provider in Haiti with a team of over 6,000. Her expertise in the field of public health informed a grant proposal to the Global Fund to Fight AIDS, Tuberculosis and Malaria, which resulted in a \$67 million grant to Haiti and Zanmi Lasante.

In 2010, shortly after the earthquake Viaud and Paul Farmer, PIH's founder, established a children's home for 64 abandoned children. Named Zamni Beni, meaning "Blessed Friends," the home is staffed by over 150 personnel providing 24 hour care to children and young adults, many of whom have physical challenges.

In 2002, Viaud was a key supporter of a health and human rights in practice article on the rights to water in Haiti. The article, "Wòch nan soley: The denial of the right to water in Haiti," speaks to the greater challenges accessing water to the poorest of the poor throughout Haiti. Also in 2002 Viaud received the RFK Human Rights Award from the Robert F. Kennedy Center for Justice & Human Rights in recognition of her innovative human rights-based approach to establishing health care systems in Haiti. Viaud was honored not only for her groundbreaking work in effective, rights-based HIV/AIDS treatment but also for advocating that health, access to medicine and clean water are all fundamental rights. In 2003 she was named one of Ms. Magazine's Women of the Year. Today she continues to work relentlessly with local governments and citizens to build government capacity to advocate and ensure these critical human rights.

## TONY WONG

### PANEL Building Resilient Communities to Withstand Increasing Extreme Weather Events' Impact on the Global Water Crisis



**Tony Wong** is chief executive of the Cooperative Research Centre for Water Sensitive Cities, with research hubs in Brisbane, Melbourne, Perth and Singapore. Wong is internationally recognized for his research and practice in sustainable urban water management, particularly Water Sensitive Urban Design. He has led a large number of award-winning projects and in 2010 received the prestigious Sir John Holland Award as Australia's Civil Engineer of the Year, cited as having defined "a new paradigm for design of urban environments that blends creativity with technical and scientific rigour."

Wong pioneered the Water Sensitive Cities approach, which takes a unique socio-technical approach for concurrently addressing the social, environmental and economic challenges of traditional urban water management. The development of this approach has encompassed a sequence of his significant achievements in research and development, technology, urban design and policy. His early work on Water Sensitive Urban Design has diffused globally, and his subsequent transformation of WSUD into the more holistic Water Sensitive Cities approach has been mainstreamed across Australia and increasingly among developing nations

Through this 20-plus-year journey, Wong has advanced new understandings of the relationship between the societal and biophysical dimensions of water security and city waterscapes—enabling solutions to be underpinned by creative design and technical and scientific rigour for delivering sustainable urban water outcomes. His recent work has focussed on improving human health in slum communities in the Asia-Pacific through a water sensitive approach to the revitalisation of slums and adjoining environments.

# SIDE EVENT DESCRIPTIONS

## MONDAY OCT. 16

### **The WaSH in Schools Annual Meeting: Towards Achieving WinS SDGs by 2030**

Global WinS Network

**Redbud**, 8:30 a.m. - 12 p.m.

The “WaSH in Schools (WinS) Day” (8:30 a.m. – 4:30 p.m.) at the UNC Water & Health Conference will provide an opportunity for practitioners, partners and researchers to join together and create a more cohesive group to support and advocate for how we can reach the ambitious goal for WinS in the Sustainable Development Goals (SDGs): that all schools have at least basic WaSH by 2030. The WinS event will be structured around the five thematic areas that have recently been prioritized by the sector: 1) advocacy, 2) monitoring, 3) sustainability, 4) programming and 5) menstrual hygiene management

Each session will review progress made to date, identify priority action areas and provide an evidence-based proposals for inclusion in the Call to Action for WinS and the WaSH in schools standards in light of the SDGs 4 and 6, and the enabling environment. The updated call will serve as a sector guide on how we can contribute to the SDGs. The event will also serve as a platform for experience sharing to support effective collaboration in the process.

### **Drinking Water Safety through Partnership: Engaging the Private Sector in Water Quality Monitoring for WaSH Projects**

U.S. Agency for International Development, The Coca-Cola Company, Global Water Challenge, The U.S. Water Partnership

**Dogwood**, 8:30–10:00 a.m.

As the Sustainable Development Goals provide new emphasis on water safety, many stakeholders are facing challenges with the water quality testing capacity in the field. From equipment to technical expertise and more, the demand for water quality is quickly outpacing the current capacity of laboratories that are regularly being used for drinking water testing. This session will explore avenues for innovative partnerships with non-traditional stakeholders, such as academia and the private sector, to bolster the capabilities of existing water quality labs. This session is designed to drive forward discussion on how these actors, and their unique expertise, can enhance water quality monitoring around the world.

The session will start with an overview of new findings from the Water and Development Alliance (WADA), supported by The Coca-Cola Company and the U.S. Agency for International Development (USAID). These findings will highlight current capacity gaps in water quality monitoring and innovative avenues to leverage partnership to address those gaps. Concepts to be explored will include training tours, supply chain support, equipment transfer, at-cost testing services and other avenues for building on existing capacities to enhance water quality monitoring.

In addition, Coca-Cola and USAID will share lessons and best practices from their current approaches for water safety, exploring how these areas of expertise can help build capacity around the world.

Following this overview from WADA, an open discussion will engage participants to explore other potential partnerships around water safety, with an emphasis on identifying other areas of expertise and capacity that partners could creatively leverage to improve water quality monitoring.



### Rethinking Rural Sanitation: Practical Pathways to Outcome-Focused Programming

USAID, Bill & Melinda Gates Foundation, UNICEF, WaterAid, Plan, PSI, UNC

**Sunflower**, 8:30 a.m. - 12 p.m.

While progress has been made in increasing access to sanitation services globally, the challenges to reaching the Sustainable Development Goals (SDG) are daunting, particularly for rural sanitation. A rethinking of traditional approaches to how donors and practitioners systematically address issues of financing, private sector engagement, institutional structures, monitoring, and scale (among others) is under way.

In rural sanitation, the predominant approaches have focused on behavior (CLTS, CATS) or markets (market development interventions). Significant evidence and learning in using these approaches already exists. However, for these efforts to be effective and sustainable, the global community of practice must continue to proactively identify and address gaps in our collective understanding of why, how and under what conditions rural sanitation interventions work best (or why they don't work), and commit to considering this evidence in designing future programming and making investment decisions.

We propose to have an open and candid discussion with leading (sanitation) practitioners, researchers and policymakers on the evidence gaps, key implementation principles and new hypotheses to test, and to begin to explore strategic partnerships to match vision with action in the coming years. This session will address key questions in sustainability (such as ODF recidivism), sequencing demand and supply interventions, sanitation subsidies, data and performance metrics, government ownership/leadership and collective impact.

The session will be structured around three objectives:

- 1) Highlight outstanding evidence gaps in rural sanitation sector, informed by comprehensive literature review performed by USAID/WaSHPaLS project
- 2) Identify common characteristics of rural sanitation approaches and comment on success and suitability in given contexts, informed by research from Plan, WaterAid, UNICEF, and UNC
- 3) Discuss potential implementation principles for collective impact

The session will include:

- Two 20 minute presentations by USAID/WaSHPaLS on CLTS and market-based sanitation global literature reviews
- A 30 minute small group discussion on evidence gaps
- A 20 minute Plan/WaterAid/UNICEF/UNC presentation on the characterization of rural sanitation approaches and the conditions determining their suitability
- 30 minutes of small group exercises using mock case studies
- A 30 minutes breakout discussion on collective impact and collaboration.
- A final 30 minute activity reconvening in plenary to hear reports from the smaller groups, synthesize proposed action items and open the floor for discussion. Breakout discussions will be guided by a pre-identified facilitator and rapporteur with targeted questions.

### Delivering a Large Scale Multi-Layered Behaviour Change Campaign in Low-Income Country Pakistan

WaterAid Pakistan

**Mountain Laurel**, 8:30–10:00 a.m.

Pakistan, with over 180 million population, is among the five countries with the highest rate of diarrheal deaths: 39,000 children die per year (approximately 110 children every day). Hygiene behaviours are still far from ideal as about 70 million people still do not use soap with water to wash their hands. Water quality is one of the root causes of Pakistan's poor health statistics. Every year around 3 million Pakistanis suffer from waterborne diseases, out of which 1 million die. Moreover, 25 million people (13% of total population), the majority of whom reside in rural areas, defecate in the open. Pakistan loses 343 billion rupees to health care costs, which is almost 4% of GDP.

Saaf Sehatmand Pakistan (Clean Health Pakistan) is a five-year, large-scale multi-layered national behaviour change campaign on water, sanitation and hygiene (WaSH) that seeks to promote healthy living by improving knowledge, attitudes and practices

related to safe drinking water, better sanitation and improved hygiene. The national campaign aims to reach out countrywide to the masses, including people living in urban and rural areas as well as those in positions of authority to change their knowledge and influence their behaviour and policies.

The campaign design involves interventions at the institutional, social and individual levels to transform organisational discourse, social norms and behavioural performance in its physical, social, psychological and temporal context. The programme theory of change sets out a cascading chain of cause and effect that must occur for behaviour to change and consequently produce the desired impact of ensuring saving lives and improving health and well-being of the people. The campaign design draws lessons from several similar initiatives in the world and target context (institutions and policy space), social norms (norm building through community campaigns and social mobilisation) and individual (behavioural performance and nudging). In addition, behaviour change will be further accelerated through mass media and “Campaign for Campaign (C4C).” The C4C engages other government agencies, WaSH sector partners and private and corporate sector including media to leverage the campaign’s content and discourse to channel through their ongoing operations or campaigns of similar nature that allow amplifying the scope of the campaign while keeping the cost low.

The proposed panel will bring lessons learned from delivering the large-scale multi-level and multi-sector behaviour and institutional centred campaign that has been built upon partnerships and collaborations with diverse stakeholders including media, academia, government, public and private sector organisations in the business and trading communities; and the population at large to promote behavioural performance on safe drinking water, better sanitation and improved hygiene.

### **Drinking Water Safety in the U.S.: Risk Quantification, Mitigation, and Communication**

RTI International USA, UNC Gillings School of Global Public Health

**Windflower**, 8:30 a.m. - 12 p.m.

Building on the theme of drinking water safety in high-income countries, this side-event workshop will address the health risks associated with drinking water quality in the United States, built around three themes: 1) risk quantification, 2) risk mitigation and 3) risk communication.

In the first half, invited speakers will discuss the themes of risk quantification and mitigation, and describe the efforts of researchers and stakeholders in the United States to understand, quantify and address the current threats to safe drinking water in the United States, including declining infrastructure, unregulated private water systems, industrial activity and naturally occurring contaminants.

After the break, invited speakers will discuss risk communication, and how to engage communities and stakeholders and effectively communicate about water quality issues and the associated health risks. The side event will conclude with a 45-minute panel to further the discussion on how to improve drinking water quality in the United States, and reduce the associated risks to human health. Key outcomes from the session will be compiled and shared with participants.

### **Strengthening Governance and Regulation of Water and Sanitation Services Towards the Realization of the SDGs**

World Health Organization

**Azalea**, 8:30–10:00 a.m.

The 2030 agenda for Sustainable Development Goals (SDGs) set out ambitious targets for drinking-water and sanitation, with a specific focus on quality of services delivered. With the SDG indicators of “safely managed” drinking-water and sanitation services, the water and sanitation sector faces new challenges, particularly in ensuring delivery of high-quality services to meet the targets, as well as in the collection and analysis of data on the quality of services, for monitoring at the national and global levels.

Ambitious as they are, the SDGs offer important opportunities for strengthening the oversight of water and sanitation services. Thus, the role of robust governance and regulatory frameworks will gain increasing importance throughout the SDG period, as they can be catalytic in improving the quality of drinking-water and sanitation services, and provide information for monitoring progress towards SDG targets.

This interactive session will examine the role of governance and regulation in drinking-water and sanitation services towards the realization of the SDGs, including global monitoring.

The first part of the session seeks to stimulate discussion on how improved governance and regulation of the quality of drinking-water and sanitation services could support achievement of the SDG targets for drinking-water and sanitation

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and protect public health. The session will include input from national regulators, researchers and law-policymakers on intermediate milestones that need to be targeted; the need for enhanced regulatory frameworks compliant with global and national minimum standards; and capacities and institutions that need to be strengthened or developed as part of progressive achievement of the SDG targets.

The second part will discuss the role of regulators in global monitoring of drinking-water and sanitation services, as well as the alignment of national priorities and policies with global targets. The session will draw on case studies from selected countries to illustrate examples of how regulatory data are being used for global monitoring of drinking-water and sanitation services, as well as how these global targets align with—or differ from—national priorities and policies. Both sessions will include inputs from representatives of regulatory agencies overseeing drinking-water and sanitation services in Kenya, Argentina and other countries.

### **WaSH for Maternal and Neonatal Health: Behaviors, Birth Kits, and Indicators**

USAID Maternal and Child Survival Program (MCSP), Save the Children

**Bellflower**, 10:30 a.m. – 12:00 p.m.

Infections account for 1.2 million neonatal deaths each year and for 15% of maternal deaths. Inadequate WaSH conditions in health facilities may deter patients, including expectant mothers, from using facilities. This evidence to action themed focus group session will discuss recent evidence and successful approaches to improving health care worker and caregiver hygiene around the day of birth to prevent neonatal and puerperal sepsis. The panel will consider sepsis reduction in the context of improved WaSH in health care facilities (HCF) and quality improvement (QI) work. MCSP will invite representatives from the following organizations to participate on a panel discussion: USAID, the Soap Box Collaborative, WHO, and LSHTM.

IAN MOISE, WaSH advisor at Save the Children and WaSH lead at MCSP, will facilitate this side event. Panelists include:

- ROBERT DREIBELBIS (PhD), lecturer, London School of Hygiene and Tropical Medicine. Dr. Dreibelbis will discuss his team's recent research in Nigeria to elucidate barriers and motivators to practicing appropriate hygiene behaviors during the period from the onset of labor through the first two days of life (to include follow-up visits at home).
- PAVANI RAM (MD), associate professor, University at Buffalo & Senior Medical Advisor for Newborn Health within the Office of Maternal and Child Health and Nutrition at USAID. Dr. Ram will share a global perspective of WaSH for Newborn Health space.
- SANDRA VIRGO (PhD), Soapbox Collaborative. Dr. Virgo will discuss Soapbox Collaborative experience working on clean birthing kits and impact on hand hygiene during labour and delivery in Zanzibar
- ARABELLA HAYTER, Water, Sanitation, Hygiene and Health, WHO: Ms. Hayter will present outcomes of WHO's recent effort to develop WaSH indicators for maternal and neonatal outcomes.

Objectives are:

- To discuss the potential impact and importance of low-cost, behavior-focused WaSH improvements on maternal and neonatal health outcomes
- To highlight recent research and programmatic experiences related to WaSH improvements for sepsis reduction, including clean birthing kits.
- To present specific metrics and monitoring activities for practitioners to track WaSH for maternal and newborn outcomes.



## How You Can Improve Your Behavior Change Interventions by Inferring which Behavioral Factors They Address

Eawag, Helvetas

**Mountain Laurel**, 10:30 a.m. – 12:00 p.m.

In the main part of the workshop, participants will analyze their behavior change strategies in groups following these four steps:

- 1) We identify which of the specific behavior change techniques (BCTs) listed in the RANAS (risk, attitudes, norms, abilities, self-regulation) catalog of 36 BCTs (see <http://www.eawag.ch/en/departement/ess/empirical-focus/environmental-and-health-psychology-ehpsy/>) occur within each intervention strategy.
- 2) For each of these BCTs, we can infer the psychosocial factors that the BCTs typically change.
- 3) We establish which of all the psychosocial factors of the RANAS model are addressed by each intervention —and which are not.
- 4) We can then infer back from the factors that were not addressed by the intervention to the BCTs that typically change these factors. The application of these BCTs should improve the intervention, because it will then address more factors which are known to change the target behavior.

In the last part of the workshop, we will collect the results of each group and summarize which factors are most often and most seldom addressed by interventions; this will allow us to identify and discuss which behavior change techniques could be applied more frequently.

The workshop should increase participants' awareness of how behavior change interventions actually work by demonstrating which behavioral factors are addressed by the BCTs typically applied in behavior change interventions.

## HWTS: Advancing the SDG Water Safety Agenda: Meeting of the WHO/UNICEF International Network on Household Water Treatment and Safe Storage

World Health Organization, UNICEF, The Water Institute, CAWST

**Azalea**, 10:30 a.m. – 12:00 p.m.

The transition from the Millennium Development Goals (MDGs) to the Sustainable Development Goals (SDGs) presents new challenges in the water, sanitation and hygiene (WaSH) sector. In particular, the SDG target for safely managed drinking-water for all underscores the need for strengthened implementation of water safety interventions such as water safety plans (WSPs) at municipal and community level, and household water treatment and safe storage (HWTS) to safeguard water quality where formal supplies may not exist or water quality is of high risk. In addition, HWTS remains an important emergency response intervention, e.g., in waterborne disease outbreaks and humanitarian situations. However, in order to comprehensively address water safety and maximize health gains, consideration needs to be given to how these and other water supply and safety interventions can be integrated.

This meeting of the HWTS Network will bring implementers, researchers and practitioners to discuss effective implementation of water safety efforts, both in “normal” situations, and emergency/humanitarian contexts. The session will provide an opportunity to take stock of what has/is being done in linking HWTS with other water safety interventions, and the questions that still remain regarding implementation efforts and more systematic collaboration with wider water safety efforts. Such input will also be useful in informing the new (post-2016) strategy of the HWTS Network, and highlight entry-points for how the network can be best positioned to contribute to the SDG drinking-water target and collaborate with other actors. The session will also provide an opportunity to learn and update on current activities of the network participating organizations/members.

## Annual Virtual Conference on Menstrual Hygiene Management in Schools

Columbia University Mailman School of Public Health, UNICEF

**Redbud**, 7:00 a.m. – 3:00 p.m.

The Annual Virtual Conference on Menstrual Hygiene Management in Schools provides an opportunity to share the latest research and programming in menstrual hygiene management in schools from around the world. Now in its sixth year, the conference will focus on making schools ready for girls by going to scale with MHM within national education systems. This sixth conference will build on the content and recommendations of the prior five conferences and continue the effort to fill in the gaps in the existing knowledge and advocacy around this important issue. The virtual conference, which will be live streamed on the web, is expected to bring together over 1,000 participants from nearly 100 countries around the world.

## New Global SDG Baselines for Drinking Water, Sanitation and Hygiene

World Health Organization/UNICEF Joint Monitoring Programme

**Dogwood**, 8:30 a.m. – 12:00 p.m.

The WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP) produces regular progress reports on global targets for drinking water, sanitation and hygiene. In 2017 the JMP produced its first progress report of the SDG period, establishing global SDG baselines for the year 2015. This side event will present highlights from the progress report, including discussion of the new SDG indicators of “safely managed” drinking water and sanitation services, key trends in access to “basic” services and new data on handwashing with soap and water.

The new indicator of “safely managed drinking water services,” for Target 6.1, is defined as the population using an improved drinking water source which is located on premises, where water is available when needed, and which is free from faecal and priority chemical contamination. Globally, 5.2 billion people (71 percent of the population) used safely managed drinking water services in 2015, while 6.5 billion people (89 percent of the population) used at least a basic level of service. Over the period 2000–2015 use of “basic” drinking water services has been increasing at an average rate of 0.49 percentage points per year, and with a modest acceleration universal coverage could be reached by 2030.

The new indicator of “safely managed sanitation services,” for Target 6.2, is defined as the population using an improved sanitation facility which is not shared with other households, and where excreta are disposed in situ or transported and treated offsite. When sewage treatment, faecal sludge management, and in situ disposal are considered, only 2.9 billion people (39 percent of the population) are considered to have safely managed sanitation services. While 5 billion people (68 percent of the population) use “basic” sanitation services and coverage has been increasing at an average rate of 0.63 percentage points per year, the rate of progress would have to increase substantially, especially in sub-Saharan Africa, Central Asia and South Asia, in order to achieve universal coverage by 2030.

For the first time, the global development agenda includes a target for hygiene under Target 6.2. Currently there are insufficient data to produce a global statistic for the indicator “availability of a handwashing facility with soap and water in the home.” However, data are available for 70 countries and highlight important regional trends.

Effective monitoring of “safely managed” services will require strengthening of national systems for the collection and analysis of data from multiple sources, and this session will present some of the challenges that this poses, along with the opportunities for enhanced monitoring of WaSH service delivery and progressive harmonisation and alignment of national and global monitoring efforts.

## Confronting the Elephant in the Room: How Do We Get from Increased Coverage to “Safely Managed” Sanitation?

PSI, Bill & Melinda Gates Foundation

**Sunflower**, 8:30–10:00 a.m.

This side event will bring in the experience from leading sanitation interventions using different approaches: the Market Development Approach (MDA) as the intervention approach as compared and contrasted against other approaches including Community led Total Sanitation (CLTS). The aim is to facilitate a dialogue among key actors, including donor organizations, in the sanitation space to deliberate on lessons learned and the opportunities and challenges these various approaches bring with a focus on the potential of MDA to accelerate progress towards meeting SDG 6. The group will generate ideas about what the vision for success should look like, the support and evidence needed by different groups of stakeholders (what we know and the knowledge gaps that still exist) that would steer investment strategies fostering to increase access to sustained investments in market development approaches for delivery of safely managed sanitation.

### Purposes:

- To bring in experience from different projects around the globe, highlighting that neither CLTS nor MDA approaches (nor any others) have addressed the move from coverage (MDGs) to safely managed sanitation as agreed in the SDGs.
- To receive feedback on the support and evidence needed towards steering investments in MDA from a broad range of sector professionals.
- This session would deliberate on this as an area of attention, and spend some time generating ideas about what needs to be addressed and how this could be done under an extended MDA.
- Participants will leave the session with new ideas and reflections that will bust some of the myths associated with MDA, for instance its role in creating equitable access.

## Results from the WaSH Benefits Trials of Water Quality, Sanitation, Handwashing and Nutritional Interventions in Bangladesh and Kenya

University of California, Berkeley; icddr,b; Innovations for Poverty Action; Stanford University; Tufts University

**Bellflower**, 8:30 a.m. – 12:00 p.m.

This session will present a large body of findings from two recently completed randomized trials on WaSH and nutrition integration, followed by a moderated discussion with active audience participation.

Commissioned by the Bill & Melinda Gates Foundation, the WaSH Benefits study comprises two closely-related, cluster-randomized trials of water quality, sanitation, handwashing, and nutritional interventions delivered alone and in combination during the first two years of life in rural Bangladesh and Kenya. The session will be divided approximately into thirds: study design and findings from Bangladesh, study design and findings from Kenya, and discussion.

The session will begin with an overview of the WaSH Benefits study design and specifics on the interventions and study samples in both countries. Outcome measures to be presented before the break include diarrhea, length-for-age (and other anthropometric measures), micronutrient deficiencies, child development, and survival. In the second half of the session (after the morning break), we will present the findings on environmental fecal contamination, parasite infections, and environmental enteric dysfunction. The session will include time for the audience to discuss 1) differences in the contexts and results found in these two different settings and 2) implications of the findings for governments, donors, and program implementers. The session will also briefly review similarities and differences with other recent and upcoming trials of sanitation interventions, combined versus single WaSH interventions, and combined WaSH and nutrition interventions that are likely to influence programming and future research in the WaSH sector.

By the end of the session, participants will be familiar with the main findings of the WaSH Benefits study and will be able to situate these results in a broader summary of the current evidence base. Additionally, participants will be introduced to the wealth of data from the two trials that will become publicly available in two years.

## TUESDAY OCT. 17 (cont.)

### Behavior Change at Scale: Bridging Research, Policy and Practice

WaterAid UK, London School of Hygiene and Tropical Medicine, World Bank

**Mountain Laurel**, 8:30–10:00 a.m.

One of the biggest challenges in the WaSH sector is to attain sustained behavior change at scale to maximise the public health benefits of infrastructure investments. But changing people's behaviour is a complex undertaking and achieving sustained behaviour change at scale has remained a challenge for the sector. What can WaSH practitioners, researchers and policymakers do to bring about the necessary behavior change? This session is designed in three parts: research, public policy and practitioner evidence. The session aims to produce a set of recommendations, or working assumptions, about what needs to happen in the largely unexplored area of behavior change in WaSH at scale.

Key questions to be addressed:

- What is the current evidence for hygiene behaviour change at scale within WaSH sector and what are the information data gaps?
- What can the WaSH sector learn from mass media and public policy behaviour change campaigns from outside the WaSH sector? What's worked and what's failed?
- What can we learn from the success and set-backs from case studies on behaviour change intervention at-scale?

The session will be facilitated by JYOTI SHUKLA, World Bank Director of GWSP. The session will be organized into two parts. In the first half, these four speakers will provide an overview of research, policy, and practice of behaviour change programs at scale:

- ROBERT DREIBELBIS (London School of Hygiene and Tropical Medicine) on the state of the art of sustained behaviour change and behaviour change at scale
- HENRY NORTHOVER, WaterAid UK on a recent review of public policy and mass behaviour change campaigns in other sectors and public life and their implications for the WaSH sector
- OM PRASAD GAUTAM, WaterAid UK on successful implementation of an innovative approach and creative behaviour change intervention at-scale through the routine immunisation program in Nepal
- CLAIRE CHASE, World Bank, on the challenges of at-scale hygiene behaviour change based on a multi-country initiative

Following the presentation, participants will be organized into three groups for facilitated discussion in each of the three topic areas (research, policy, and practice). A closing plenary will collect recommendation from each group and outline practical recommendations for behaviour change initiative at scale.

Expected outcomes:

- Researchers, practitioners and policy-makers from the WaSH, health, and behaviour change sector will leave the session aware of the current evidence base and concrete examples from the field on the effects of large scale sustained behavior change intervention within and beyond the WaSH sector.
- Participants will be clear on the types of creative action that should be taken by programmers or policymakers based on the current evidence base to attain sustained behavior change at scale.

### Routine Use of Multiple Household Water Sources

University of Alabama, Johns Hopkins University, Stanford University, University of Technology Sydney, The Water Institute

**HIGH INCOME COUNTRIES**

**Windflower**, 8:30 a.m. – 12:00 p.m.

While global water research and monitoring typically focus on the household's "main source of drinking-water," the routine use of multiple water sources to meet daily household needs has been noted in many developing countries. However, there are few studies quantifying or describing these practices in detail. Following recent calls from the WaSH community for further investigation (e.g., Evans et al. 2013; Overbo et al. 2016) a number of research groups have begun to investigate the topic (e.g., Smith et al. 2015, MacDonald et al. 2016, Foster and Hope 2017, Vedachalam et al. 2017; Elliott et al., in review).

Overall, their emerging findings strongly support the contention that the use of multiple water sources is both widespread and necessary to meet household water needs in many developing country settings. We propose that failure to account for multiple household water sources can undermine the design and effectiveness of WaSH monitoring, data interpretation, programming and research.

Additionally, this emerging research area must mature in order to produce findings that are interpretable and generalizable. While the emerging data are consistent on the big picture, a nuanced reading of these recent studies reveals that they yield data that are not directly comparable (e.g., data on water access vs. water use, use for drinking vs. any water use, number of sources vs. number of source types, cross-sectional use vs. reported use in any season). As a research community, we must establish terminology, methods and best practices to produce data that are comparable across studies and settings.

In this workshop, we will gather many of these multiple water sources researchers to both briefly summarize existing and emerging data and to begin a conversation on establishing:

- 1) Precise terminology and clarification of which methods yield which outcome variables
- 2) Ways that existing secondary data can be used to investigate this topic (including possible correction for seasonality)
- 3) Likely implications of multiple sources for progress toward the SDGs
- 4) Best practices for integrating multiple sources into research and practice

Participants will produce two deliverables:

- 1) An editorial for publication in a WaSH journal summarizing the research-related findings and, if we believe it's justified, a call to the research community to integrate multiple sources into data collection
- 2) A more practice- and policy-focused deliverable on multiple sources alerting the community of emerging multiple sources research, potential implications and potential courses of action

### Choosing a Product that Works: Household Water Treatment and Safe Storage in Emergencies

World Health Organization, ELRHA Humanitarian Innovation Fund, CAWST

**Azalea**, 8:30–10:00 a.m.

Safe drinking-water is an immediate priority in most emergencies, and household water treatment (HWT) and safe storage is often an essential emergency response intervention. However, the HWT technology market is diverse, and not all technologies are effective in improving water quality, or are accepted by users. Independent evaluations of HWT technology performance and acceptability can help inform procuring humanitarian agencies, governments and users at large in HWT product selection.

The World Health Organization (WHO) established the International Scheme to Evaluate Household Water Treatment Technologies (the Scheme) to independently and consistently assess the microbial performance of HWT technologies against WHO health-based criteria. In addition to these laboratory evaluations of HWT efficacy, field evaluations of ease of use, robustness, etc., are also useful in informing product selection. The Humanitarian Innovation Fund (HIF) recently launched the Emergency Household Water Filter Challenge to evaluate the performance and acceptability of water filters in humanitarian emergencies. The funded research will test five different filters and explore not only technical and logistical performance in different emergencies, but also a range of qualitative aspects of how users engage with the filters and what might increase filter usage.

This interactive session seeks to bring together implementers, humanitarian agencies, HWT manufacturers and researchers to discuss selection of HWT technologies. Specifically, the session will:

- 1) Present an overview of the results of Round II of the WHO Scheme and application of these results in HWT selection
- 2) Outline the methodology for the HIF filter challenge and seek feedback
- 3) Stimulate discussion on key needs to strengthen implementation of HWT in emergency relief contexts, including strengthening quality management of manufacturing.

Expected outcomes are:

- Increased understanding of WHO performance recommendations for HWT and their application in product selection
- Increased awareness of the HIF filter challenge, its planned outputs and linkages to the WHO Scheme

## TUESDAY OCT. 17 (cont.)

### HEPI: Supporting WaSH Actors Get Ready for the Next Health Emergency

UNICEF

**Sunflower**, 10:30 a.m. – 12:00 p.m.

The years 2015 and 2016 were marked by many humanitarian crises, including the unprecedented spread of Ebola in West Africa. The recent outbreaks of Zika, cholera, yellow fever and others are reminders of the importance of surveillance, preparedness, and a well coordinated response. A number of global post-Ebola assessments have highlighted the need for collective preparations to be made to ensure that the world is ready and able to respond to future health emergencies.

In September 2015, UNICEF launched the Health Emergencies Preparedness Initiative (HEPI). This initiative, which seeks to strengthen the organization's capacity for responding to health emergencies is being done in coordination with partners, including WHO, the U.S. Centers for Disease Control and Prevention and others.

Under the HEPI initiative, UNICEF has identified a set of prioritized diseases on which organizational preparations are based. For each priority disease, UNICEF is developing a "package of support," which consists of guidance, resources and tools necessary for a well-coordinated and rapid response in the event of an outbreak. This also includes disease-specific supply requirements and pre-positioned stock.

The event's objective is to present the latest thinking and preparedness initiatives on WaSH responses in health emergencies.

Expected outcomes:

- Dissemination of guidance, resources and tools that were developed under the HEPI initiative
- Mobilization of experts and partners around the subject

### Theoretically Informed, Evidence-Based Intervention Design and Evaluation: Approaches and Lessons Learned from Three WaSH Behavior Change Studies in Ethiopia, Kenya and India

Emory University, London School of Hygiene and Tropical Medicine

**Mountain Laurel**, 10:30 a.m. – 12:00 p.m.

The purpose of this side session is to draw attention to and share practical processes for developing and evaluating theoretically informed, evidence-based WaSH interventions. We will walk participants through the process of using the USAID methodology for developing a theory of change, drawing on our own work in Ethiopia, Kenya and India as case studies, and provide a brief overview of the various behavioral change models available to support the development, implementation and evaluation of theory and evidence based interventions, including the Behavior Change Wheel (Michie et al. 2011), the RANAS Model (Mosler 2012) and Behavior Centered Design (Aunger & Curtis 2016). We will also discuss different strategies of testing and refining interventions prior to broad-scaled implementation.

This session will provide an opportunity for various participants—practitioners, researchers and donors—to learn how to apply these methodologies to WaSH programs, to discuss intervention design in the context of WaSH programming and research, and to share lessons learned from their own work. The session will include presentations and participatory activities geared at increasing awareness of change theories, frameworks, and tools and their practical application, and an open forum to share lessons learned and best practices.

Theory provides a solid foundation for the development of behavior change interventions and a roadmap for coherent program evaluation. While there are a multitude of intersecting and overlapping behavior change theories and frameworks, their systematic application in the development, implementation and evaluation of WaSH interventions is limited. Further practical guidance for researchers and practitioners is warranted to promote the incorporation of theory into WaSH intervention design and evaluation.

Expected outcomes:

- Future collaboration
- Improved practical understanding of theory-based program design approaches



Knowledge to Practice: The Global Water Pathogen Project as a Resource for Quantitative Risk-Based Water and Sanitation Safety Planning *Cancelled*

Global Water Pathogen Project

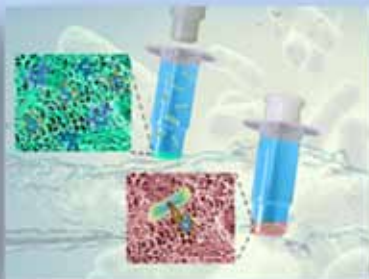
Wintergreen, 10:30 a.m.—12:00 p.m.

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## WaSH in Emergency: How We Do It and What Do We Know About It?

Action Against Hunger, Office of U.S. Foreign Disaster Assistance (USAID/OFDA), UNICEF (Global WaSH Cluster), Civil and Environmental Engineering Department at Tufts University, Medentech, Global Communities

**Redbud**, 8:30 a.m. – 12:00 p.m.

WaSH is a systematic key intervention in emergency responses. The need for sufficient safe water, avoiding the spread of contamination by containing feces and improving sanitary conditions, and ensuring minimal hygiene practices are essential for public health safety, and to restore dignity for any population affected by a disaster.

**Panel 1: WaSH in emergencies: How we do it and what do we know about it? (8:30–10:00 a.m.)**

The side-event will start with a panel covering most of the scope of emergency actors, with representatives from: an institutional donor (USAID/OFDA); an implementing NGO (Action Against Hunger); the agency coordinating responses (UNICEF/WaSH Cluster); a research center working on the impact of emergency interventions (Tufts University/CEED), and a private company producing items widely used in emergency (Medentech's Aquatabs).

The panel will present different perspectives on WaSH emergency response:

- What priority activities and projects are funded, based on what criteria and information
- How emergency responses are designed and implemented
- How the sector coordinates to ensure the needs are covered equitably and without overlap
- What role the private sector plays in supplying response, and how products are adapted to feedback
- What is proven to work in emergency, what gaps in evidence remain
- What issues researchers face with the information, or lack of, provided by the responders in order to use it for sound evidence generation and to bridge knowledge gaps

**Panel 2: Case study of recent major emergencies: Syria and Yemen (10:30 a.m. – 12:00 p.m.)**

Specialists who have been directly involved in the response in Syria and Yemen will present how the WaSH sector operates in response to the needs, how it interacts at the various levels, including with governments, and what lessons can be learnt.

The panels will then open for discussion with the audience to answer questions, identify bottlenecks and opportunities, challenge positions, and look for ways forward to continue improving the quality and impact of the WaSH services delivered to the populations affected by disasters.

Expected outcomes are to:

- Increase audience understanding of the mechanisms in emergency response;
- Highlight gaps between the stakeholders, and in particular for the scientific community to provide evidence to influence a better response
- Create networking opportunities between emergency responders, influencers and the scientific community to initiate potential partnerships for research



## Continuing to Address Waterborne Disease in the United States

Centers for Disease Control and Prevention

HIGH INCOME COUNTRIES

**Dogwood**, 8:30 a.m. – 12:00 p.m.

The mission of the Waterborne Disease Prevention Branch is to track and investigate waterborne disease and outbreaks, build waterborne disease prevention capacity in state and local health departments, and develop effective prevention strategies to improve health. While drinking water disinfection has been recognized as one of the top 10 public health achievements of 20th century, waterborne disease continues to occur in the United States. Outbreaks are reported to the Centers for Disease Control and Prevention (CDC) each year, particularly in underserved populations (i.e., those served by private wells, non-community systems and small community systems). Additionally, the uses for potable water have expanded. Water used in medical devices, facility heating and cooling systems, manufacturing processes and agricultural operations has been associated with outbreaks and illnesses. A CDC effort to quantify the burden of waterborne disease has highlighted the role of premise plumbing and biofilm-associated pathogens, challenges not currently well-addressed by regulations or disinfection practices. Drinking water infrastructure continues to age, while climate change and extreme weather events place additional strain on systems. Meanwhile, most state and local health departments lack dedicated waterborne disease prevention programs. Recent large water-related emergencies have demonstrated the enormous health and economic implications of drinking water system failures. These events erode public trust in municipal drinking water systems and disproportionately impact vulnerable populations.

This session will describe the current state of waterborne disease in the United States, outline challenges and data gaps, and articulate opportunities for improving disease surveillance and prevention. The goals of session are to:

- 1) Highlight common themes from recent waterborne disease outbreaks and water-related emergencies, particularly in vulnerable populations
- 2) Discuss intervention and prevention efforts
- 3) Discuss needed capacity among stakeholders to more effectively prepare for and respond to waterborne disease, outbreaks, and water-related emergencies
- 4) Improve understanding of ongoing and emerging public health issues related to drinking water in the United States.

We will generate a list of ongoing issues related to WaSH in the United States, which will likely be similar to challenges faced by other researchers who work in a high income settings globally, and ask the audience for recommendations and strategies that worked for their groups.

## Moving Beyond ODF; Measuring the Road Towards SDG 6.2

Water Supply and Sanitation Collaborative Council Global Sanitation Fund, IRC, University at Buffalo

**Sunflower**, 8:30–10:00 a.m.

In this side event the organisers will share and discuss recent experiences in programming and monitoring for scale, sustainability and equality in sanitation and hygiene behaviour change programming.

The Global Sanitation Fund of WSSCC uses targeted investments in large scale collective behaviour change and strengthening of the enabling environment, to see entire administrative areas become and remain open defecation free and gradually achieve SDG 6.2, therewith providing proof of concept and igniting and supporting a movement aimed at nationwide and then global achievement of SDG 6.2. IRC has been working to develop strong monitoring systems that are in line with the sustainability check and sustainability compact requirements now required by core WaSH donors such as the Government of the Netherlands. It has been doing this with GSF, UNICEF and several other sectors partners. The University at Buffalo has rich expertise on ways to measure the behavioural and social effects of sanitation and hygiene interventions, particularly focused on use of latrines and handwashing behaviours.

In 2016 the GSF began working with IRC and the University at Buffalo to develop a new Results Framework and M&E approach to measure and validate the range of outcomes and outputs related to collective behaviour change programming at scale. These tools are designed to provide detailed data and insights on the sustainability of sanitation and hygiene behaviours and ODF status, social norms and habit formation and equity and inclusion. The results framework further aims to measure the progression from ODF to SDG 6.2 and the uptake of technologies and services; as well as shifts in the systems and capacities at national and subnational level required to enable scale up and ensure sustainable service delivery.

## WEDNESDAY OCT. 18 (cont.)

In the side event, we will introduce the results framework and monitoring tools and present (preliminary) data from outcome surveys in Nepal, Malawi, and Togo to discuss, among others:

- What can we say about sustainability of ODF communities and the factors that influence this?
- Can we identify a difference in social norms in villages that have become Open Defecation Free as compared to those with residual open defecation?
- Are women and girls and people with reduced mobility being sufficiently included in decisions around their sanitation and hygiene facilities and are they satisfied with the services they use?
- Are ODF communities climbing up the ladder towards sustainable, safely managed sanitation services and what are the links between behaviour, technology type, and access to the market?

The session aims to generate discussion on how organisations across the sector, with support from donors, can move towards harmonization of approaches, frameworks and indicators to measuring sanitation-related outcomes such as ODF; sustainability of behaviour change, and strengthening of enabling environments at all institutional levels.

### Advancing Research Methods in Gender and WaSH: Sharing Lessons from Applied Field Experiences and Charting a Course for Future Work

Iris Group, Kathleen O'Reilly, Bethany Caruso

**Bellflower**, 8:30 a.m. – 12:00 p.m.

The Sustainable Development Goals have clear targets for WaSH and for marginal groups' access to WaSH resources, especially for women and girls. Making progress towards these targets requires specific tools that reveal the needs of excluded groups and pinpoint ways in which programs and policies can be improved in pursuit of inclusive WaSH outcomes. Over decades of gender mainstreaming, scholars, practitioners and policymakers have developed tools that identify the needs of women and girls in WaSH. There is continued interest in applying these tools to new contexts and developing novel techniques of incorporating gender into WaSH programming.

Responding to a need for evidence-based solutions, this side event will highlight the progress to date in gender and WaSH methodology and chart paths forward in order to more fully address the WaSH-related needs of women and girls. Given that these populations continue to be disproportionately affected by poor WaSH conditions, it is imperative to improve WaSH outcomes to reduce physical hardship and psychosocial stress experienced by women and girls and broadly improve health and well-being for all.

This half-day side event brings together scholars and practitioners to present and discuss research methods that inform gendered WaSH interventions and solve WaSH problems as women and girls understand them. The goal of the side event is to present the state of the methodology and discuss opportunities for improving existing tools and methods in future applications.

Activities include presentations about field-based methods that have informed:

- 1) Toolkits for practical use and training
- 2) Assessment tools specifically aimed at gender and WaSH information gathering
- 3) Applications to gender and WaSH programming.

These presentations will be short and interactive and will be followed by extended discussion periods during which participants will be able to explore the strengths, weaknesses, and contextual specificities of existing methods. Attendees will also have the opportunity to share experiences in working with gender mainstreaming methodologies including but not limited to the tools that were presented during the side event.

The side event will conclude with discussion in small groups (e.g. scholars, practitioners, donors) to:

- 1) Highlight opportunities for applying existing tools to better understand the gender and WaSH landscape
- 2) Enumerate which areas need greater work
- 3) Identify which tools and resources may be needed to advance progress in these areas.

By convening scholars and practitioners working in (or interested in working in) gender and WaSH, we hope to create a community of practice that continues to engage in the conversations initiated during the side event. A virtual forum would serve as a resource for individuals working in gender and WaSH and as a way to advance research methods in this area.

## Behavior Change in Rural and Urban Sanitation

Eawag, Bill & Melinda Gates Foundation

**Mountain Laurel, 8:30–10:00 a.m.**

Inadequate sanitation in both rural and urban areas is one of the most challenging problems in low- and middle-income countries. Many people still practice open defecation, households have inadequate or unused latrines, many households discharge their toilets into open drains and toilets are poorly maintained, meaning that they pose a serious health risk. Many of these problems require changes at the household level. For instance, even if open discharge of fecal sludge is forbidden by law, households still have to comply, and in many parts of the world this is not the case. Thus, the main question is how households can be motivated to improve their sanitation situation and thus to climb up the sanitation ladder. This requires analysis of the drivers of and barriers to households' constructing, purchasing, renting, using, improving and maintaining toilets and of investing in a connection to a sewer system (the last mile). To achieve this, the perceptions, beliefs, and feelings of the people who perform these behaviors, the psychosocial factors, must be analyzed together with the structural, institutional, and economic context factors that also foster or inhibit these behaviors.

Consequently, the objectives of this side event are to:

- Work out which sanitation problems need to be tackled with behavior change at the household level, in both rural and urban contexts
- Identify contextual and psychosocial factors that influence sanitation behavior
- Communicate the findings of successful behavior change interventions in rural and urban sanitation and to compare approaches
- Accentuate the differences and similarities in how sanitation problems should be tackled in rural and urban contexts

Several short presentations will point out the importance of behavior change in sanitation, explore determinants of sanitation behavior, compare different approaches to behavior change in sanitation, present examples of successful behavior change interventions in rural and urban sanitation and report the experiences of implementing organizations in applying different approaches in rural and urban contexts. After these presentations, a plenary discussion will address these questions:

- Where in rural and urban contexts do we need behavior change interventions in sanitation on the household level?
- What are the differences in context and in the drivers of behavior change in rural and urban contexts?
- Which behavior change approaches in sanitation have been proven to be successful in rural and in urban contexts?

The concluding discussion should result in preliminary answers to three questions:

- Which sanitation problems in rural and urban contexts have to be tackled with behavior change interventions?
- Which driving factors of sanitation should be taken into account?
- Which interventions seem to be successful only in rural contexts?

## Sustainable WaSH Systems for Sustainable WaSH Services

University of Colorado–Boulder

**Windflower, 8:30–10:00 a.m.**

The SDGs call for sustainable WaSH services in recognition of the evidence that shows that a significant percentage of WaSH infrastructure built during the MDG era are not functioning and not providing basic service delivery a few years (or even shorter) after construction has been completed. The WaSH community increasingly recognizes that a projectized business-as-usual approach is not delivering sustainable services. A growing number of government and development partners understand that a key to sustainable services may be to take a systems approach that works to improve how stakeholders and institutions in the WaSH sector interact with and influence each other to produce desired results.

USAID has launched a research initiative called the Sustainable WaSH Systems initiative to learn more about how to work with systems and to learn if this approach can lead to more sustainable WaSH services. This showcase will introduce the four systems change approach concepts that are being implemented in Cambodia, Ethiopia, Kenya and Uganda. The Sustainable WaSH Systems Learning Initiative is led by the University of Colorado–Boulder and partners include IRC, WaterSHED, WHAVE, Oxford, UNICEF, Tetrattech, LINC and Environmental Incentives. Other organizations working on systems approaches will also present.

### How Much is Spent on WaSH? Answering the Billion Dollar Question

World Health Organization, World Bank, Bill & Melinda Gates Foundation

**Azalea**, 8:30–10:00 a.m.

Using financial resources in the WaSH sector more effectively will be essential for achieving the SDGs. Yet, the majority of countries do not know how much they are currently spending on WaSH. This session will present the results of work through the UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS) and TrackFin to track the amount and type of financing to the WaSH sector at the national level. These results will form the basis for extracting common results and recommendations for improving the way funds are currently mobilized, channelled and utilized in the WaSH sector.

Since the launch of the TrackFin methodology by WHO at Stockholm World Water Week in 2012, several governments are developing WaSH accounts to build a more concrete understanding of how much is being spent on WaSH, by whom and on what. Countries that have done so include Ghana, Brazil, Morocco (which were the early pioneers) as well as Burkina Faso, India, Kenya, Kyrgyzstan, Mali, Tunisia and Senegal. They have been supported in these efforts by a number of development partners, including WHO, the World Bank, the Bill & Melinda Gates Foundation, AFD, DFID, SDC, DGIS, UNICEF, USAID, WaterAid and IRC.

In addition to the success of TrackFin, countries participating in GLAAS have also been able to report an increasing amount of financial data. The GLAAS 2017 report provides the most comprehensive information on WaSH financing from countries and external support agencies to date. The results of the GLAAS 2017 report are evidence for governments and development partners to better allocate and utilize WaSH financing.

### Exposure to Animal Feces and Human Health

Emory University, Public Health Institute, Stanford University, Tufts University

**Wintergreen**, 8:30–10:00 a.m.

This side event will consist of scientific presentations of epidemiologic analyses from multi-center WaSH/diarrhea studies and from recent literature reviews. The agenda is:

- 1) Review of animal feces exposure and human health outcomes (PIs: KAREN LEVY and MATTHEW C. FREEMAN)
- 2) Animal feces exposure in the WaSH Benefits study (PIs: AMY PICKERING and AYSE ECRUMEN)
- 3) Risk factors for carriage of zoonotic enteric pathogens (PI: JAY GRAHAM)
- 4) Animal risk factors for moderate-to-severe diarrhea in children under 5 years old enrolled in GEMS Kenya (PI: DARRYN L. KNOBEL)

The global health and development community has increasingly focused on efforts to improve sanitation over the past decade, with mixed results on child health and growth outcomes. Sanitation initiatives focus on separating humans from contact with their own excreta; however, less attention has been given to containing animal feces. Poorly managed animal feces can lead to human exposure to pathogens, which is of particular concern in low- and middle-income countries, where animals often live in close proximity to humans.

Animal feces may harbor several pathogens capable of causing diarrhea and growth shortfalls in children, as well as negative health consequences for adults, particularly those who are immunocompromised or pregnant. Recent advances in molecular detection methods and microbial source tracking have given new insights on the transmission of pathogens from animals to humans; however, there remain gaps in the knowledge of the role of animal feces in contributing to global morbidity and mortality via pathways related to water, sanitation and hygiene (WaSH).

This side event will address these gaps by:

- 1) Reviewing the state of the literature on the impact of exposure to animal feces on human health
- 2) Identifying the WaSH pathways of exposure to animal feces,
- 3) Identifying pathogens of particular concern that contribute to the burden of disease from poorly-managed animal feces
- 4) Presenting epidemiologic research on animal-related risk factors for diarrhea and zoonotic pathogen carriage
- 5) Identifying priority areas of research critical to reducing the burden of disease from insufficiently-managed animal feces.

## Swachh Bharat for Urban India: Toilets and Beyond

CEPT University (India), RTI International USA

**Sunflower**, 10:30 a.m. – 12:00 p.m.

The Government of India launched the Swachh Bharat Mission (SBM) in 2014 with the ambitious goal to ensure hygiene, waste management and sanitation across the nation. SBM is a landmark initiative, and it has raised sanitation to a national movement at a scale few countries have undertaken.

What is being achieved in the urban context? Progress is being achieved, including improved facilities and a range of the steps to achieve open defecation free (ODF) towns, cities and states. An estimated over 750+ cities will be ODF by October 2017, and 4–5 states may also declare this status. While there is success on many fronts, challenges remain for cities and towns to reach ODF, and how these locations can sustain ODF through not just toilet provision but sound fecal sludge management. The workshop will look at programming under SBM and review new MoUD FSM guidance (2017). Presentations will focus on work from selected small towns in Maharashtra, how these cities are moving beyond ODF, to focus on ODF Plus+, with various approaches to tackle fecal sludge management. The side event will also review field observations on new non-sewered sanitation technology pilots in Gujarat and Tamil Nadu.

This side event's objective is to share the learning from the SBM experience with the conference audience, identifying the mechanisms through which progress has been made, sharing observations about field implementation, and frame some of the programmatic challenges are ahead.

Part 1: Plenary presentation of case studies and field experience (50 minutes)

In the context of SBM and new FSM guidelines, CEPT and RTI presentations will detail how ODF status has been achieved in medium-sized towns in Maharashtra State, and will look at new technology options and the learnings from pilots in Gujarat and Tamil Nadu.

Part 2: Facilitated open discussion forum (40 minutes)

Expected outcomes:

- A view of SBM from selected case experiences, and an understanding of how ODF status is aiming to be achieved and planned in urban India
- An understanding of opportunities and challenges for sustaining city and state sanitation coverage under SBM

## WaSH Away from the Home: Possible or Pipe Dream for Dislocated Populations?

World Vision, University of North Carolina—Chapel Hill

**Mountain Laurel**, 10:30 a.m. – 12:00 p.m.

Universal access to basic water, sanitation and hygiene (WaSH) have long been recognized as important for human development, well-being, and health – yet service levels are low in many low- and middle- income countries. In international development policy, Sustainable Development Goal (SDG) 6 calls for universal access to basic WaSH services by 2030 and improvements in levels of service. Universal access includes WaSH in non-household settings such as schools, health care facilities, workplaces, refugee camps, orphanages and prisons.

While policymakers, practitioners, and researchers have emphasized WaSH improvements in schools and health care facilities, settings with “dislocated populations” (i.e., displaced persons) such as refugee camps, orphanages, and prisons have received comparatively little attention in terms of WaSH services and environmental conditions. There are an estimated 140 million orphans worldwide and 8 million children live in orphanages. An estimated 8 million people are incarcerated worldwide. Sixty million people are displaced. Adverse environmental exposures while in these settings degrades human health and development outcomes. These problems are overlooked and growing, and there is an opportunity to identify policy and programmatic approaches to remediate the situation in these settings.

The goals of this session are to:

- Improve awareness and understanding of dislocated populations in refugee camps, prisons, and orphanages
- Identify and describe the challenges faced by each setting in terms of WaSH and environmental conditions
- Identify research gaps
- Identify improvement opportunities in terms of monitoring, policy and practice

### District-Based Initiatives for Achieving SDG6: Experiences of Leveraging Partnerships and Building WaSH Local Government Systems in Ghana, Burkina Faso, Uganda, Ethiopia, Niger and Mali

IRC, Hilton Foundation

**Windflower**, 10:30 a.m. – 12:00 p.m.

Ensuring universal access to safe and affordable drinking water for all by 2030 requires collective effort and cooperation to deliver the targets across the entire water cycle. Achieving SDG 6 requires coordination and aligning with country systems to bring sustainable water, sanitation and hygiene. What does that mean in practice?

With support from the Conrad N. Hilton Foundation, IRC and other partners are working with local governments in Ghana, Burkina Faso, Uganda, Ethiopia, Niger and Mali to co-create a common agenda and leverage partnership to coalesce efforts towards providing 100% sustainable WaSH services at the local government level. Together, we promote harmonised district level work, in support of national WaSH governance systems to build an evidence base, for successful universal services within a district. Results of the project will provide the basis for strengthened local governments capable of delivering sustainable WaSH services. The results will also provide a basis for replication in the respective countries and in time in other countries.

The event will showcase the experience in developing a shared vision for addressing universal WaSH coverage with local governments and partnerships forged for delivery. Together with our local and national government partners and the audience, we will probe into the challenges and opportunities for achieving the goal and the possibility for replication. We will seek input and reaction from the audience to improve the programme.

### Financing WaSH: How to Increase Funds for the Sector While Reducing Inequities

IRC, Water.org

**Azalea**, 10:30 a.m. – 12:00 p.m.

There is an inherent challenge facing the WaSH sector: sustainability of services for everyone. As of 2015, 660 million people still do not have access to improved drinking-water sources and over 2.4 billion people do not have access to improved sanitation. This is due to “systems blindness”—a focus on the tangible infrastructure without attention to the supporting systems. IRC and Water.org have identified three key issues that need to be considered as ministers of finance work with relevant ministries to develop financing strategies that will enable their respective countries to meet their SDG 6 targets:

- 1) Finance for strengthening the enabling environment
- 2) Micro and blended finance as untapped financing mechanisms
- 3) Addressing inequities in allocation of finance in the sector (implementing financing systems that ensure marginalized communities have equal access to services)

Ultimately, decisions about financing strategies for SDG 6 will be made by country ministers of finance and assorted relevant ministries. However, the WaSH sector will be able to offer input in a variety of ways that differ depending on organization and context. Therefore, the goal of this session is to arm participants with a deeper understanding of the need for governments to address these three key issues so that they can offer up these ideas as points for consideration within their communities as the conversations for SDG 6 continue to evolve. Participants may also find that building approaches to tackle one or more of these three key issues could strengthen their WaSH program design process.

The session will be highly interactive and take the format of an introductory session followed by three roundtables, one dedicated to each key issue outlined above. Participants will rotate through the tables to have deeper facilitated discussions on each topic. Role-playing may also be incorporated to help participants internalize evaluating concepts from different perspectives.

## From Evidence to Advocacy: Using Research to Drive Change

Global Handwashing Partnership

Wintergreen, 10:30 a.m. – 12:00 p.m.

With the inclusion of hygiene in the SDGs, hygiene researchers, implementers, and advocates have an unprecedented platform to support the advancement of effective policies and practices in hygiene—but how can we combine our strengths to drive this? This session will focus on exploring the role of research in advocacy, providing examples of how research has been used in advocacy, as well as how formative research can be designed for both programmatic and policy outcomes.

In this session, we will:

- 1) Provide an overview of key advocacy terms, messages, and frameworks
- 2) Offer examples of how research has informed advocacy from the perspectives of researchers and advocates
- 3) Engage in active discussion on how researchers and advocates can collaborate to ensure that evidence is used for maximum impact

The session will open with four short presentations.

- CAROLYN MOORE, secretariat director of the Global Handwashing Partnership, will provide a brief introduction to advocacy, with examples of how advocacy has been used to increase handwashing.
- CAROLIEN VAN DER VOORDEN, senior programme officer at the Water Supply & Sanitation Collaborative Council, will introduce examples of how implementation or research findings can inform advocacy, with examples of where this has worked well, where it worked less well, and why.
- OM PRASAD GAUTAM, senior WaSH manager at WaterAid, will describe how WaterAid has used formative research to design programs for both implementation and policy outcomes.
- JULIA ROSENBAUM, senior behavior change specialist at FHI 360, will present how new research findings on handwashing and newborn care were applied at both global and Ethiopia country levels.

Following these initial presentations, the event will move to an active discussion facilitated by CAROLYN MOORE. This discussion will involve panelists and audience members to explore opportunities and tensions between advocacy and research, the role of research in policy formation, and ideas for improved collaboration between researchers and advocates. After an initial panel discussion, the event will move to open discussion with the audience. To conclude, presenters will present a brief list of tools and resources to help participants further their learning.

This session will help researchers and advocates understand ways to facilitate the development and delivery of effective, evidence-based messages. Participants will leave the session with a well-honed understanding of their potential as advocates, and armed with new skills and tools develop advocacy from research findings. While the session will focus primarily on hygiene, the tools and approaches used can be applicable across the WaSH sector.



## Improving the Management and Sustainability of Small Water Supplies: Guidelines on Small Water Supplies

World Health Organization

**Redbud**, 8:30 a.m. – 12:00 p.m.

The World Health Organization develops Guidelines on Drinking-water Quality (GDWQ), which provide the basis for the establishment of national drinking-water quality standards and regulations worldwide. Recognizing the challenges inherent in managing and sustaining drinking-water quality in small water supply systems, WHO published the GDWQ Volume 3: Surveillance and control of community supplies in 1985, which was revised in 1997.

Small water supplies continue to be an important source of drinking-water for a significant portion of the population and face the same challenges identified in the 1997 guideline. Since the guideline was developed, significant experience has been gained with management of small water supplies, particularly with sanitary inspections and water safety plans (WSPs). WSPs were introduced in the GDWQ in 2004 and are widely considered the most effective approach to managing drinking-water safety. Accordingly, there is a need to update this guideline to take account of new evidence and identified best practices, including WSPs. As part of this work, WHO is undertaking a review of the evidence base and application of sanitary inspections (including the sanitary inspection form format and questions, and the accompanying technical and management advice) and exploring options to better align with WSPs.

This event will provide an update on progress made on the revision of the WHO GDWQ: Small Water Supplies. The optimum drinking-water quality management approaches for various types of small water supply systems will be explored (including, for example, standard setting, WSP implementation and surveillance activities). Further, the programme of revision for the sanitary inspection package will be presented, including the outcomes from a recent piloting programme, and feedback will be sought on the current trajectory and format of the revised package. These above themes will be explored interactively through both open and panel discussions.

## Ensuring Drinking Water Affordability: Challenges and Opportunities in Current Policy Making at Local, State and National Levels

UCLA Luskin Center, UNC Environmental Finance Center

**HIGH INCOME COUNTRIES**

**Dogwood**, 8:30–10:00 a.m.

The affordability of drinking water service for households in the United States has become a topic of increased interest for scholars, policymakers and communities as retail prices for drinking water have risen dramatically in the past decade. Moreover, household-level affordability has been enshrined as one of three tenants in the Human Right to Water (HRW) discussions in the United States, but has received much less rigorous research support than the other dimensions of the HRW.

This session draws on the extensive experience of two research-policy centers, the UCLA Luskin Center and the UNC-Chapel Hill Environmental Finance Center, in providing research support and technical assistance to local drinking water systems, non-profits and state policymakers to enhance affordability and broader household welfare. Namely, the UCLA Luskin Center has for the last several years advised the State of California on the design of what will be the first state-wide drinking water low-income rate assistance (LIRAs) program in the United States. Moreover, the UNC EFC has worked with water utilities on issues of drinking water affordability for decades, and recently engaged in several national studies on a. state by state regulations enabling LIRA programs for drinking water, b. addressing the issue of hard-to-reach-customers in LIRA programs.

The goals of this session are to a. bring together the best thinking among researchers, activists and policymakers currently advising drinking water systems and governments on LIRAs/affordability policy, b. address big-picture concerns and gaps in knowledge in our understanding of how drinking water affordability can and should be defined at the household or system level c. widen the visibility of the affordability-health connection among the broader pool of Water and Health conference participants focused on other dimensions of the HRW.



## Potential of Pathogen Hazard Tracking for Sanitation Planning

The Water Institute

**Sunflower**, 8:30–10:00 a.m.

A number of research institutions and sector players are interested in developing better tools to understand excreta and pathogen flow in communities and the environment. The purpose of this side event is to allow participants to learn through experience the potential benefits and constraints of such an approach as a tool for sanitation planning.

The first 30 minutes of the session consists of a brief presentation on approaches to the problem being developed, including Q&A. The second 30 minutes of the session will consist of participation in one of three working groups, each of which will be given hypothetical pathogen-hazard data at one of three scales—national, municipal or community—along with a planning question to address. The final 30 minutes will be a group discussion of both the value such data could add to sanitation planning, along with the challenges of such an approach (limited data, assumptions, etc.).

## The Business Case for Women in WaSH

iDE, PSI, Water.org

**Bellflower**, 8:30–10:00 a.m.

In the last few years, gender has become an important focus in WaSH, with increased institutional donor requirements for gender-sensitive WaSH programming. The discourse to date tends to describe women as a vulnerable population disproportionately affected by poor WaSH conditions, requiring focused attention as a beneficiary group. Positioning women as disadvantaged and needing assistance inadvertently perpetuates a view of women as weak and dismisses their potential contributions. The conveners believe that women can be powerful agents of change in WaSH, especially in market systems. They are not just passive beneficiaries of WaSH outcomes, but are also critical in driving WaSH outcomes.

The conveners are starting to see evidence that when women are involved in managing businesses, selling products and repaying loans, businesses perform well, sales are high and loans have high repayment rates—ultimately enabling more households to access WaSH products and services. Moreover, when women are involved in the purchase process, anecdotal evidence indicates greater ownership and usage by the entire family. Equally as important, household access to WaSH enables women's empowerment via increased productive time that can be allocated to work (and income) or education.

Building on these insights, the session will stimulate discussion on the business case for women in WaSH and inspire new frameworks and opportunities for research and collaboration. While the conveners have observed these results, the observations and underlying causes must be discussed and validated. The session will also touch on gender dynamics observed in market and household contexts.

The session aims to begin a conversation to better understand the role of women as change agents in WaSH markets and economic development, rather than just beneficiaries of WaSH outcomes. Specific objectives include:

- Articulating different roles women play in WaSH—beneficiaries, clients, or market actors
- Sharing the latest evidence on the impact of women in WaSH markets on business performance and WaSH outcomes, seeking input from participants' experiences
- Highlighting the substantial contributions that women are able to make in business and, subsequently, economic growth through access to WaSH and WaSH enterprises
- Moving the discourse beyond women to understand the nuanced gender dynamics of WaSH supply and demand

Illustrative questions include:

- How do men and women interact in WaSH enterprises?
- How does women's involvement affect business performance?
- How do men and women interact in household WaSH purchase decisions?
- How does women's involvement in purchase decisions affect usage and sustained behavior change?
- How do targeted marketing campaigns impact larger WaSH objectives?
- Why are we observing these effects?
- Identifying areas for further research and collaboration on the business case for women in WaSH
- Stimulating deeper exploration on this aspect of women in WaSH

### Global Health Security Agenda (GHSA) Enteric Disease Outbreak Response Capacity Building Toolkit

Centers for Disease Control

**Mountain Laurel**, 8:30 a.m. – 12:00 p.m.

The Global Enteric Disease Outbreak Response Capacity Building Toolkit was funded by the Global Health Security Agenda (GHSA) and developed by the Centers for Disease Control and Prevention's (CDC) Division of Foodborne, Waterborne, and Environmental Diseases (DFWED). The purpose of the toolkit is to prevent, detect and respond to outbreaks from foodborne, waterborne and environmental sources. The scope of the toolkit touches on numerous topics but focuses on capacity building within the key areas of epidemiology, environmental health, clinical laboratory and environmental microbiology through technical assistance, work force development, and monitoring and evaluation. Developing countries often receive one-off trainings to increase capacity in these key areas, but trainings often do not address the overall preparedness needed to prevent, detect and respond to an outbreak.

This side event will provide an overview of the contents of the toolkit, with a specific focus on the water, sanitation and hygiene (WaSH) modules and discuss the implementation of three main toolkit components:

- 1) Sustainability for work force development
- 2) Delivery and evaluation
- 3) Staff retention

The workshop will be divided into one-hour sessions for each component. For each, CDC will generate a list of anticipated challenges, which will likely be similar to challenges faced by researchers, practitioners, non-governmental organizations and others who work in global settings, and ask the audience for solutions that worked for their groups or other challenges encountered. This dialogue will be facilitated using a guided PowerPoint presentation and handouts. Ultimately, the goal of this session is to discuss lessons learned from various experts on capacity-building implementation plans and to incorporate these lessons into the next phase of the GHSA DFWED toolkit.

### Moving WaSH in Health Care Facilities from Assessment to Action: What are the Solutions?

The Center for Global Safe WaSH at Emory University

**Windflower**, 8:30 a.m. – 12:00 p.m.

In 2015, the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) released a landscape report on the status of WaSH in health care facilities (HCF) in 54 developing countries. The report highlighted major gaps in WaSH coverage for health care facilities such that nearly 40% of HCF lack access "to even rudimentary levels of WaSH" (WHO/UNICEF 2015). However, many practitioners and researchers, including members from the Center for Global Safe Water, Sanitation and Hygiene (CGSW) at Emory understand the situation to be far worse than what was captured in this initial report. First-hand experience from WaSH in HCF research and program implementation in low-income countries indicate that water shortages, poor water quality, deteriorating water infrastructure, rudimentary sanitation and poor hygiene are highly prevalent and comprehensive assessments of WaSH infrastructure and services are rarely undertaken. Yet in the midst of the limited data regarding the true status of WaSH conditions in HCF and the increased effort to refine indicators and build the evidence base, the health risks for vulnerable groups are compounding. The challenges with environmental cleanliness and appropriate infection control exacerbated by poor WaSH infrastructure and services have significant implications for pregnant women, newborns, sick children and immunocompromised patients. The confluence of poor WaSH conditions within an environment that cares for highly susceptible populations creates an urgent need to move the global conversation of WaSH in HCF from assessment to action.

This side event brings together research and practice leaders in global WaSH, with a particular emphasis on individuals and organizations who are thinking through and acting upon solutions to address the gaps in WaSH coverage in their health care facilities. Short presentations will highlight best practices in infrastructure improvements informed by assessment, behavioral interventions with health care workers, the use of the WHO WaSH Facility Improvement Tool (WaSH FIT) and other program implementation components such as partner coordination, management engagement and accountability. Group discussions will explore the challenges and lessons learned of implementing both hardware and software interventions in health care facilities. Finally, building on discussions from the WHO and UNICEF's WaSH in HCF Global Learning Event held in Nepal (March 2017), actionable solutions will be considered in terms of cost and feasibility of scale-up.

## **SWA: What are We Learning from Engaging Finance and Sector Ministers in High-Level Sector Dialogues?**

Sanitation and Water for All

**Azalea**, 8:30 a.m. – 12:00 p.m.

The Sanitation and Water for All (SWA) partnership promotes and supports ongoing, multi-stakeholder dialogue at the national, regional and global level. As part of this process, SWA has held regular, global, high-level meetings involving ministers of finance (2010, 2012, 2014 and 2017) and ministers responsible for sanitation, water and hygiene (2010, 2012, 2014, 2016 and 2017). This session will be an exploratory discussion to understand what the partnership is collectively learning from this systematic and regular process of engaging key political leaders. Participants will also contribute to understanding the knowledge gaps, including what we need to know to fully harness political influence for consistent action to remove the bottlenecks impeding progress towards achieving the Sustainable Development Goal targets for drinking water and sanitation.

The session will examine the key inputs those advocating for progress can provide to decision-makers, including the kind of evidence they need and find most useful. The participants will also discuss the trade-offs decision-makers face, best practices in ensuring development effectiveness, and factors that sustain a timely, coherent and strategic dialogue among sector actors. Recent processes to revise the SWA Accountability framework and insights from a number of country case studies being undertaken by SWA partners will contribute to the discussions.

The session will end with perspectives on the lessons the partnership is learning as well as areas that might require further inquiry in order to improve the engagement of high-level political actors.

## **Something to Squawk About: A Fresh Look at the F Diagram and Neglected Pathways Impacting Child Growth**

World Vision, WaterSHED

**Wintergreen**, 8:30–10:00 a.m.

Globally, 24% of children under 5 were stunted with higher rates of stunting in much of sub-Saharan Africa and Asia (UNICEF, WHO, and World Bank, 2015). Concurrent exposures of inadequate diet and poor water, sanitation and hygiene (WaSH) conditions predispose infants and young children to a debilitating cycle of infections and undernutrition in early life. Recently, enteric environmental dysfunction, a condition of the small intestine that inhibits permeability and nutrient absorption, has been identified as a potential mediating factor between poor WaSH conditions and chronic undernutrition. Enteric environmental dysfunction is thought to explain the modest effect observed in reducing child stunting even with the most rigorous dietary interventions, independent of the effects of diarrhea.

For nearly six decades, routes of pathogen transmission have been identified and summarized in a seminal “F-diagram” via fluids, feces, fields (floors, earth, dirt), fomites (surfaces), fingers and food. The traditional F-diagram focuses exclusively on human pathogens, and the relative magnitudes of these pathways remain largely unknown. A recent review of the literature highlights the need to heighten focus on 1) domestic animal excreta as a source of risk, and 2) direct ingestion of pathogens via “floors,” specifically dirt and excreta, as a high-risk pathway not disrupted by the available suite of WaSH measures.

After providing highlights from the literature review (little is known about the relative risk of the various exposures, e.g., improved flooring can be more effective than sanitation in reducing diarrhea), this side event will focus on pioneering efforts to block infant and young child ingestion of human and animal feces through carefully crafted design of technologic/behavioral dyads. Specifically, this side event will present and discuss a diverse range of interventions focusing on introduction and use of playmats and playpens, chicken corralling and child potties. We have intentionally chosen to highlight interventions addressing the various F pathways through both public and private sector actors.

## THURSDAY OCT. 19 (cont.)

### Addressing WaSH Needs Within the Transgender Community

Water Supply and Sanitation Collaborative Council, World Health Organization, The Water Institute

**Dogwood**, 10:30 a.m. – 12:00 p.m.

The objective of this event is to share successes and challenges for transgender people with regards to their WaSH needs, taking into consideration those who are most affected on a daily basis from both developed and developing country contexts. This session also provides an opportunity to bring together stakeholders from a variety of backgrounds to discuss a collective way forward with regards to policy and practice through joint action.

The session will be a mix of discussion and presentations from a cross-section of stakeholders: activists, development agencies, private sector, academia and government.

Presentations to include:

- Listen and Work with Us: AMES SIMMONS, director of Transgender Policy, Equality North Carolina
- Measuring Success: New Metrics: RICK JOHNSTON, World Health Organization
- Experience Working with Transgender Communities: ANDRES HUESO, WaterAid
- Partnership with Government of India: Transgender WaSH modules and SBM Gender Guidelines: ARCHANA PATKAR, Water Supply and Sanitation Collaborative Council

### WaSH for Vulnerable Populations in Peri-Urban Areas

London School of Hygiene and Tropical Medicine, SHARE Research Consortium

**Sunflower**, 10:30 a.m. – 12:00 p.m.

Although water, sanitation and hygiene (WaSH) figures for the last two decades have shown an overall increase in the percentage of the global population with access to improved infrastructure, progress in urban areas has been far slower than rural areas and has failed to keep pace with the explosive growth in urban, informal settlement populations (UNICEF/WHO Joint Monitoring Programme). The shift in focus of the global development framework on WaSH, from percentage access targets in the Millennium Development Goals to universal and equitable access in the Sustainable Development Goals, is laudable in its ambition to redress evident inequities. To achieve universal access, efforts must focus on the hard-to-reach communities, including low-income informal environments. Often characterised by poverty, high-population density and inadequate infrastructure, these areas present unique challenges to human development.

This side event will draw on recent research to discuss the unique challenges present in urban areas in low-resource countries.

Speakers:

- OLIVER CUMMING, LSHTM: Early childhood enteric pathogen exposure among vulnerable populations in informal settlements of Maputo, Mozambique and Kisumu, Kenya (MapSan and Safe Start trials)
- ROBERT DREIBELBIS, LSHTM, and JANE MUMMA, GLUK: Caregiving and informal caretaking among vulnerable populations in informal settlements of Kisumu, Kenya (Safe Start trial)
- JENALA CHIPUNGU, CIDRZ: Land tenure as a determinant of vulnerability in urban areas of Lusaka, Zambia (SanDem trial)
- LUIS ANDRES, World Bank (TBC): Disparities of access and health outcomes in peri-urban areas (incl. poverty diagnostics research & tool)
- HENRY NORTHOVER, WaterAid: City-wide sanitation planning in four sub-Saharan African countries

The five presentations will showcase how urban vulnerabilities manifest on multiple levels that influence child health outcomes and provide barriers and opportunities for effective WaSH interventions.

## Launch and Learn: Sharing New Evidence and Guidance on Menstrual Hygiene Management in Humanitarian Response

Columbia University, International Rescue Committee

**Bellflower**, 10:30 a.m. – 12:00 p.m.

Columbia University and International Rescue Committee have collaborated on the development of a Menstrual Hygiene Management (MHM) in Emergencies toolkit through support from Research for Health in Humanitarian Crises (R2HC) over the last two years, in partnership with the humanitarian response community.

This side event has three objectives:

- 1) To update attendees on recent findings in relation to addressing MHM in emergencies, through presentations from Columbia University, the International Rescue Committee, the Office of U.S. Foreign Disaster Assistance (OFDA) and Médecins Sans Frontières (MSF)
- 2) To introduce the MHM in Emergencies toolkit
- 3) To conduct small group discussions on strategies for enhancing coordination and collaboration for mainstreaming MHM within response efforts.

At the end of the session, attendees will have gained important learning on the evidence on MHM in Emergencies and will be equipped with new tools for improving response activities. The organizers hope to gain new insights on how to promote and encourage the mainstreaming of MHM, as led by WaSH teams, into other relevant sectors within organizations (e.g., health, education, protection).

## Sector Reform Processes for Strengthening WaSH Systems in Ghana and Uganda

IRC

**Wintergreen**, 10:30 a.m. – 12:00 p.m.

This side event will provide a platform for participants to share information and experiences on how they work together within the wider complex systems that deliver WaSH services; specifically we will look at what works, what does not work, how roles and responsibilities are understood and what challenges and incentives can drive or hinder positive change. The session will aim to enable participants to:

- 1) Understand the WaSH systems currently operating in Ghana and Uganda, including the various dynamics and building blocks that make up these systems;
- 2) Share experiences of how they are working within WaSH systems more generally;
- 3) Dialogue on how different WaSH stakeholders can support and engage the strengthening of country sector WaSH systems
- 4) Identify the practical obstacles, and ways to tackle them, improve coordination and increase sector funding, regulation and monitoring.

## Latin America and the Caribbean Framework for Safe Drinking Water

Pan-American Health Organization

**Dogwood**, 8:30–10:00 a.m.

In Latin America and the Caribbean (LAC), over 34 million people are still consuming water from unimproved or unsafely managed sources. This is a significant and challenging problem, especially given that an unequal number of this people are residing in rural areas, high density areas and small towns. To provide a safe drinking framework, WHO has introduced a conceptual Framework for Safe Drinking Water (SDWF) in the Guidelines for Drinking-water Quality. This framework provides a preventive, risk-based approach to managing water quality, comprising three key components:

- 1) Health-based targets based on an evaluation of health risks
- 2) Water safety plans
- 3) Water surveillance

Currently, there is an historical momentum for LAC to work towards the 2030 Agenda and its Sustainable Development Goal 6. In this regards, the Pan-American Health Organization–Water and Sanitation Regional Technical Team (ETRAS) has been working to bring together a wide audience of national counterparts from LAC countries from regulation and water suppliers to discuss preconditions to the mobilization of each component of a safe drinking framework in LAC, through a clear regulatory framework, better access to water surveillance information systems, identification of improvement/upgrade needs, prioritization of investments, financial resources to implement needs and capacity building programs in place to transfer knowledge. To understand which circumstances can promote and facilitate the implementation of a clear safe drinking framework, ETRAS is promoting the participation of key national authorities from Andean and Centro American countries to foster a discussion on how far can we build an enabling environment for a safe drinking framework, through a deep analysis of the following topics:

- 1) How a comprehensive regulatory framework can support SDWF
- 2) How providing platforms and opportunities for capacity building can foster SDWF
- 3) How developing financial mechanisms can incentivize and support SDWF

## Calling All WaSH Experts: Tools and Case Studies for Multi-Sectoral Actions

The BabyWaSH Coalition, World Vision

**Sunflower**, 8:30–10:00 a.m.

As implementation of the Sustainable Development Goals (SDGs) gains steam, it is becoming clearer how important the foundation of clean water, sanitation and hygiene is for all the other goals to be successful. Thriving communities with economic opportunities rely on WaSH infrastructure to keep people free from infection and disease and able to work. WaSH is also key for productivity, particularly in agriculture. As the WaSH sector continually moves beyond the household setting (schools, health facilities, workplaces, etc.), it is essential to work with other sectors to ensure work is tailored to the proper context and meets the needs of the people it is aimed to help. Education, health and agricultural professionals are therefore key stakeholders to consider when designing WaSH programs to have the greatest possible impacts.

This side event will focus on how the WaSH sector can take ownership of multi-sectoral planning to have a larger impact on health outcomes than it could alone. The BabyWaSH Coalition will present practical, succinct tools on program guidance and advocacy for multi-sectoral actions, and World Vision will present a project from Kenya that is blending sectors for improved health outcomes. Additional ideas and suggestions will be recorded from the session to take the work of the BabyWaSH Coalition forward.

## **A Journey of Gender Mainstreaming in WaSH: From Evidence to Gender Intentional and Transformative Programming**

Bill & Melinda Gates Foundation, WaterAid, Emory University, London School of Hygiene and Tropical Medicine

**Bellflower**, 8:30 a.m. – 12:00 p.m.

The Gender Equality and WaSH programs at the Gates Foundation have recently worked together toward a better integration of gender in the WaSH strategy. During this side event we want to share our learnings from this journey with other WaSH organizations and brainstorm what practical steps we can all agree on to make future WaSH programming more gender intentional and transformative.

The journey started with a thorough and impartial review of the evidence on the importance of WaSH for gender outcomes and of gender for WaSH outcomes. We will take some time to share the highlights of this review. For example, we will present the strength of the evidence behind the linkages between WaSH and gender-based violence, and WaSH and girls' education, which are often mentioned but not always well documented. Researchers from LSHTM and Emory will present a new quantitative and qualitative results on the role of gender in WaSH. We will also present and seek feedback from the audience on some of the key evidence gaps that were found during the review.

The journey continued with an inward-facing scrutiny, looking at whether and how the WaSH program at the Gates Foundation is currently integrating gender in its investments. We will present the highlights of this scrutiny, giving examples of investments in which gender was intentionally addressed and also of missed opportunities. A couple of key WaSH organizations to volunteer similar examples from their programming. Building on these examples, we will conclude with an interactive brainstorm session on practical steps that can be taken to formalize the inclusion of gender in future WaSH programming.

## **Biosand Filter Updates: Implementer Support Tools, Research and Inquiry**

Lehigh University, Centre for Affordable Water and Sanitation Technology, Pure Water for the World

**Windflower**, 8:30 a.m. – 12:00 p.m.

The purpose of this side event is to build upon the side events we hosted in 2014 (Biosand Filters: Defining Future Research Directions for Greater Impact), 2015 (Biosand Filters: Connecting Research with Implementation) and 2016 (Monitoring of Biosand Filter Construction and Implementation Programs) by bringing the biosand filter (BSF) community back together to share updates on the current state of BSF research and inquiry. We intend to bring together researchers, practitioners, government officials, consultants, manufacturers and funders to share knowledge and contribute to group discussions.

In the first half of the session, participants will be introduced to new support materials for the BSF community, including new animated instructional videos, the manual for school-sized intermittently operated slow sand filters, the updated sand grain analysis spreadsheet and the sand grain analysis app. We will also facilitate a series of activities designed to give feedback on the current BSF construction manual and knowledgebase, both of which are in the process of revision. Participants will have an opportunity to create a wish list to be considered in the version updates and to share from their experiences where the current support materials are strong and where they need strengthening.

In the second half of the session, invited speakers will share research findings on topics such as performance of BSFs constructed with river sand, comparison of methods for BSF filter maintenance, assessment of BSF monitoring programs, BSF carbon credit monitoring and scale-up of BSF programs, among others. We will advertise a call for BSF-related research abstracts. This session will provide an appropriate venue for conference attendees who have submitted a BSF-related abstract but who are not selected for podium presentations during the general conference to present their work. The second half of the session will be organized such that presentations on related topics will be scheduled consecutively and followed by a facilitated group discussion on future research needs in that particular area. We envision two or three grouped presentations and facilitated discussions, depending on the number and content of submitted abstracts.

The overall goal is to share knowledge across the BSF community, identify ongoing research needs and facilitate collaborations among researchers, implementers and funders in support of future work.



### **Walking the Talk: How Programs are Embodying the SWA Collaborative Behaviors**

SWA, Agenda for Change

**Azalea**, 8:30–10:00 a.m.

This side event will begin with a brief introduction to Agenda for Change, followed by a presentation examining how Ethiopia has taken concrete steps to commit to the Sustainable Water for All (SWA) Collaborative Behaviors (CB)'s. The room will then break into 4 groups, one for each of the CBs. Each group will be led by either CARE, IRC, WaterAid or SPLASH—all organizations with a long history of working with the government and in communities on WaSH in Ethiopia.

The groups will consider:

- 1) What progress is being made in Ethiopia in this area?
- 2) What further evidence or work is needed?
- 3) From the GoE perspective, what is still missing?
- 4) How can GoE, NGOs and research institutions collaborate better? What are the roles of each?

CARE will develop a brief report based on notes and feedback from the participants and then shared widely within the sector and the Government of Ethiopia.

### **Ceramic Pot Filters: Current Research, Future Directions and Defining Next Steps**

Ceramics Manufacturing Working Group, Tufts University

**Wintergreen**, 8:30 a.m. – 12:00 p.m.

The purpose of this side session is to bring together those involved in filter manufacturing, marketing, dissemination and research in order to share successes and challenges over the past year and discuss future directions, challenges and solutions. We will have presentations and discussions on relevant topics including developments in research and we will discuss current needs and goals for the following year.

### **Knowledge Management and Translating Evidence to Action: A Case for Context Specificity**

WaterSHED, WaterAid

**Redbud**, 10:30 a.m. – 12:00 p.m.

The need for context specificity and complexity awareness of WaSH interventions is widely recognize among the community of practitioners and policy makers (e.g., UNICEF's WaSH strategy 2016–2030 or USAID's Water and Development Strategy 2013–2018). Adapting interventions to the local context has proven to make programs more impactful, cost-effective and sustainable in solving the complex challenge of ensuring everyone has access to safely managed sanitation, drinking water and lives in a hygienic environment. Yet, standard practice of knowledge management does not always allow the communication of highly complex, context-specific factors that drive the design of interventions and contribute to the success of programs.

In 2016, WaterSHED and WaterAid partnered to explore new ways of skill sharing and learning to overcome the challenges highly complex environments impose on learning. WaterSHED is a local Cambodian NGO that uses a systems approach to build markets for WaSH products and services. Since 2009, WaterSHED has produced and used rigorous context-specific evidence to design, scale up and refine its sanitation marketing program in Cambodia with the aim to strengthen market actors, their relationships and the environment they operate in. Widely accepted and used guidance on sanitation marketing is based on WaterSHED's approach (<http://www.sanitationmarketing.com/>).



Sanitation marketing is an emergent area of work for WaterAid. Following evidence from programme evaluations, WaterAid is looking beyond the application of single approaches to address complex sanitation challenges. While very efficient in generating demand for sanitation, community-led approaches are increasingly unable to deliver holistic and sustainable services for households once the initial mobilisation wanes. WaterAid therefore is exploring how to build integrated models to address the complexities of the sanitation challenges on demand and supply side. (<http://www.susana.org/en/resources/library/details/2207>)

In early 2016, eight of WaterAid's senior WaSH officers from six different country programmes across the globe met with WaterSHED's senior program staff in Cambodia for an intensive two-week skill sharing program. Apart from presentations and field immersions, the participants engaged in discussions and workshops to co-create new ideas for sanitation marketing in Cambodia and their home/host country. A year and a half later, representatives from WaterSHED and WaterAid reconvened to evaluate the effectiveness and efficiency of this learning method.

During this side event, the convenors will present the findings of this evaluation and engage with the participants in a discussion to explore approaches to learning and knowledge management that show awareness of the complex context programs operate in. The purpose of the session is to discuss benefits and drawbacks of different complexity-aware approaches to learning and advocate for their importance as learning methods.

### **Does Evidence Even Matter? CSO Strategies for Ensuring It Does**

iDE, SNV, East Meets West Foundation

**Dogwood**, 10:30 a.m. – 12:00 p.m.

Every year, the global WaSH sector invests significant resources in research and evidence generation. However, if such evidence cannot be translated into meaningful action for implementation and policy, is it worth the investment? Barriers such as resource constraints, project cycles and insufficient internal monitoring and evaluation capacity and resourcing make it hard for organizations to gather and analyze data to inform implementation. On the other end of the spectrum, information overload leaves staff with little mental space to discern which information is most relevant or time to think about how to move from data on outputs to evidence of outcomes and impact. What strategies can be used to avoid the pitfalls of evidence without action?

The conveners will present examples of how as international CSOs engage in WaSH programming they are using a combination of evidence and a culture of learning to adapt programmatic approaches and influence policy and sector dialogue to improve sanitation and hygiene outcomes in Asia. Building on past research around organizational learning, the workshop will foster a discussion on the enablers and barriers to moving beyond discrete data points and end of project evaluations to continuous learning and adaptive management.

Key questions include:

- How can organizations identify effective evidence gathering methods tailored to different goals and types of action?
- How can development organizations use a variety of evidence and information sharing approaches to influence different audiences such as local governments, other NGOs, and the broader WaSH sector?
- How can implementers overcome barriers to move beyond evidence generation and knowledge gathering to practical action?
- What factors need to be in place to ensure evidence is used to drive programmatic changes?

### **Amplifying Impact: The Case for Advocacy and Ways to Measure It**

IRC, Simavi, Akvo, Water.org

**Sunflower**, 10:30 a.m. – 12:00 p.m.

The purpose and goal of this session is to help the WaSH sector frame and effectively measure advocacy efforts and outputs.

An effective enabling environment is essential to maximize programmatic outcomes and impacts. In many locations where WaSH programs are under way or most needed, however, the capacity of local institutions and policies leaves a significant gap between what can currently be achieved as compared with the ideal. Strategic advocacy activities, when coordinated and

integrated with programmatic activities, can significantly bolster the enabling environment and consequently enhance larger organizational objectives.

Generally speaking, advocacy activities are less frequently undertaken by WaSH practitioners. One contributing reason is that the progress of these activities is commonly perceived as more difficult to monitor and impacts harder to measure—especially within tight timeframes.

The goal of this side event is to encourage more WaSH practitioners to include and integrate advocacy activities into their work by demystifying advocacy and its measurement. The session will be led by several organizations that have been deeply involved in advocacy measuring and monitoring over the past few years.

The first component of the session will be for this group to introduce successful advocacy work as it relates to WaSH and encourage participants to consider and embrace a broad scope of advocacy activities that can accelerate impact.

From there, the session will shift into more of an interactive learning session (the vast majority of the 90 minutes) and work through the following set of questions:

- When do we measure advocacy?
- Given the long-term baseline for many advocacy activities, how do we measure the interim effectiveness of advocacy activities (which will more often align with funded program timelines) and adapt as we go?
- What types of tools exist for measuring advocacy and when would you use one versus the other? (Outcome mapping, outcome harvesting, the media)
- How do organizations that have a strong track record of high-quality programmatic work incorporate these “other” measurement metrics into their pre-existing frameworks? How do they build organization-wide support for such initiatives if they have never previously been incorporated?

Possible success indicators for this session will be:

- A high level of audience participation, even if it is asking questions that are very resistant to integrating advocacy into programmatic work
- Attendee outreach to any of the session co-conveners for more details related to tools, frameworks design, or building organization-wide support for advocacy
- Invitations to revisit advocacy impacts at the 2018 Water & Health Conference or other sector gatherings, ideally with a larger cadre of partners than those leading this inaugural session

## Can New Technologies Support Water Quality Management in Rural, Low Resource Settings?

University of Oxford

**Azalea**, 10:30 a.m. – 12:00 p.m.

Water quality monitoring relies heavily in this SDG period on measurement of *E. coli* at the household. The use of *E. coli* monitoring is the gold-standard for drinking water quality monitoring and remains an essential part of the health management tools. However, it has limitations as an indicator of health risk: It is resource intensive, which means limited data is usually collected on a single source; and results are not available to water users or managers immediately. In resource-limited settings it cannot provide enough data to support water quality managers understanding risks to better target interventions. It is applied in developing countries to verify that the water is not safe to drink, but it does not enable action.

New technologies are available to support water quality monitoring, such as rapid DNA testing kits (e.g., MinION), probes for tryptophan-like fluorescence (Sorensen et al. 2015) and holographic microscopes. These will not replace current *E. coli* methods but can act as an important tool for understanding microbial water quality risks and supporting interventions and actions to improve water quality.

Objectives of this side event:

- 1) To discuss the role that new technologies can have in water quality risk assessments and water quality monitoring, with a particular focus on the information needed (and by whom) to support interventions and actions to improve water quality
- 2) To bring together policy makers, technology developers and technology users to explore what types of evidence might be required to consider adopting different technologies to support water quality risk assessments and monitoring

The format will be a panel discussion, with a panel comprising technology experts/developers, technology users and policy makers, such as a representative of the JMP or government. The panel will be a maximum of 6 people and will be developed from attendees with consideration of gender balance and inclusion of panellists from developing countries. The panel will be chaired by KATRINA CHARLES, co-director of REACH: Improving water security for the poor.



# ONE-YEAR

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# POSTER PRESENTATIONS

## MONDAY OCT. 16

### CLIMATE RESILIENCE

1. **Sustainable WaSH Systems**  
ADAM HARVEY, Whave Solutions
2. **Designing and Implementing National Monitoring Systems with Appropriate Sectorial Indicators for Heavy Precipitation and Flooding on Drinking-Water Supply and Drainage Systems: A Key Necessity for Adaptation to Climate Change**  
ANTHONY AKPAN, Pan African Vision for the Environment
3. **Enhancing Climate Resilience of WaSH Systems and Activities through Water Security**  
ELIZABETH KENDALL, Winrock International
4. **Building Climate Resilience in the Health Sector in Developing Countries: Experience from Tanzania**  
HUSSEIN MOHAMED, Muhimbili University, School of Public Health
5. **Impact of Climate Change on Water and Health in the Coastal Megacities of India**  
SHADANANAN NAIR, Nansen Environmental Research Centre (India)

### WaSH IN HEALTH CARE FACILITIES

6. **Baseline Assessment of Water, Sanitation and Hygiene (WaSH) in Health Care Facilities in Malawi**  
FRANCES REULAND, The Water Institute
7. **Exploring the Relationship Between Sanitation and Wellbeing: A Best Fit Framework Synthesis**  
GLORIA SCLAR, Rollins School of Public Health, Emory University
8. **Clean and Safe Health Facilities Initiative: Implementation and Lessons in Ethiopia**  
KEBEDE GELA, World Health Organization
9. **Water, Sanitation and Hygiene Conditions in 67 Healthcare Facilities in Uganda**  
HABIB YAKUBU, Center for Global Safe WaSH at Emory University
10. **USAID/MCSP's Clean Clinic Approach: Empowering the Haitian Health System to Improve WaSH in Health Care Facilities**  
MARIE MAUD JEAN, Save the Children
11. **Handwashing Stations in Health Care Facilities Lack Sufficient Conditions to Control Infections across 10 Countries in Africa and Asia**  
NATALIE EXUM, Johns Hopkins University
12. **Sustained Use of Portable Handwashing and Drinking Water Stations in Health Care Facilities—Siaya County, Kenya, 2016**  
WILLIAM DAVIS, Centers for Disease Control
13. **Systematic Literature Review of Surface Disinfection Efficacy to Inform Recommendations for Low-Resource Outbreak Settings**  
KARIN GALLANDAT, Tufts University

### SANITATION

14. **Social Microbes Haiti: The Impact of Deteriorating Latrines, Open Defecation and Animals on Diarrheal Pathogen Environmental Contamination Patterns in a Peri-Urban Settlement of Corail, Haiti**  
DANIELLE MEDGYESI, University of Iowa
15. **Economic and Energy Analysis of Novel Neighborhood Fecal Sludge Treatment Systems that Use Supercritical Water Oxidation**  
MARC DESHUSSES, Duke University

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16. **Operational Research on Rural Water Safety Plans: Case Study Results from Implementations in India, DRC, Fiji and Vanuatu**  
GABRIELLE STRING, Tufts University

#### WaSH IN SCHOOLS

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17. **WaSH in School Premises: Key Findings from an Assessment Held in Nine States of India**  
NIDHI PASI, WaterAid India
- 
18. **Menstrual Hygiene Management in School: A Case of Water Scarce Coastal Bangladesh**  
SAFINA NAZNIN, WorldFish Bangladesh & South Asia Office
- 
19. **A Systematic Review of Costing and Financing of WaSH in Schools**  
HEATHER MURPHY, Temple University
- 
20. **Biosand Filter Performance After Periodic Abandonment in Honduran Schools**  
BARBARA STEWART, Bowdoin College
- 
21. **Demonstration of Low Cost Handwashing at Scale: The Volta Region Tippy Tap Campaign**  
PAA KWESI WOODE, UNICEF Ghana
- 
22. **Football for WaSH: An Innovative Initiative for Scaling Up WinS in Kenya**  
AGNES MAKANYI, UNICEF Kenya
- 
23. **Advancing WinS Progress Nationwide in Fiji through Enhanced Monitoring**  
MAMITA BORA THAKKAR, UNICEF Fiji
- 
24. **In Kiribati, Everybody WinS!**  
MAMITA BORA THAKKAR, UNICEF Kiribati
- 
25. **WaSH in Schools for DRR**  
LALIT PATRA, UNICEF Vietnam
- 
26. **Improved Functionality of School Water Supply, Sanitation and Hygiene (WaSH) through MSH (Mind-Soft-Hard Ware) and MnE Tools in Nepal**  
KATAK BAHADUR, UNICEF Nepal
- 
27. **What It Takes to Mobilize Public Finance for Improving WaSH in Schools? A Case Study of Mirzapur District in Uttar Pradesh of India**  
PRATIBHA SINGH, UNICEF India-Pradesh
- 
28. **Evolution of WinS Programming in India over the Decade Conforming to JMP Service Ladder for Monitoring WinS in the SDGs: The Clean School Awards—Swachh Vidyalaya Puraskar—Five Star Based Benchmarking of Schools**  
PRATIBHA SINGH, UNICEF India Country Office and ACSI
- 
29. **Strengthening Government Capacity and Community Commitment toward Improving WinS in Indonesia**  
APRIL M. KLEIN, Emory University
- 
30. **DepED WinS: Scaling-Up WaSH in Schools in the Philippines**  
JON MICHAEL R. VILLASENOR, UNICEF Philippines
-

## EVIDENCE TO ACTION

1. **The Anaerobic Digestion Pasteurization Latrine: Updates from Four Years of Field Experience**  
LUCAS ROCHA MELOGNO, Duke University
2. **Determinants of Latrine Use and Open Defecation in Four Districts of Northern Ghana**  
MICHAEL FISHER, The Water Institute
3. **Application of Continuous Quality Improvement Methods to Improve the Microbial Quality of Household Stored Water and Decreasing Borehole Repair Times in Northern Ghana**  
MICHAEL FISHER, The Water Institute
4. **Fecal Sludge Management in Haiti, or What Really Happens to All That “Stuff”?**  
JEAN ALLAIN DARIUS, Centers for Disease Control
5. **Soil Ingestion by Children in Rural Ghana: Ingestion Frequency, Caregiver Perceptions and Associations with Diarrhea**  
VALERIE BAUZA, University of Illinois at Urbana-Champaign
6. **Indicator Efficacy: Anthropological Approaches to Evaluating Household Water Access in the Colombian Amazon**  
LILY RUBINO, Iona College
7. **Understanding Interventions with Multiple Water, Sanitation and Hygiene Elements (Multi-WaSH) in Low and Middle Income Contexts**  
MATTHEW VEDRIN, University of Michigan
8. **Business Concepts of Fluoride Removal Technology: A Case Study of Nakuru Defluoridation Company Limited, Kenya**  
NANCY GITHUGO, Nakuru Defluoridation Company
9. **From Words to Action: Linking Policy and Institutional Frameworks to Sanitation Provision and Hygiene Promotion in Rwanda and Uganda**  
NELSON EKANE B, KTH, Royal Institute of Technology
10. **WaSH Interventions in Emergencies and Outbreaks: Results from Two Systematic Reviews**  
TRAVIS YATES, independent consultant
11. **WaSH Microfinance Operations in India: An Assessment of Challenges and Successes**  
HEATHER ARNEY, Water.org
12. **Management and Sustainability of Community Water Systems in Rural Guatemala and Benin**  
COLLEEN LEONARD, Center for Global Safe WaSH at Emory University
13. **Operating Model for the Long-Term Sustainability of Biosand Filtration in Haiti**  
ASHLEY DANLEY-THOMSON, Florida Gulf Coast University

## MENSTRUAL HYGIENE MANAGEMENT

14. **Increasing Women’s Participation in Water Governance Institutions by Transforming Social Norms**  
ADITI KRISHNA, Iris Group
15. **Addressing Girls Menstrual Health and Hygiene Needs Through Improved WaSH Infrastructure and Education in Kyrgyzstan**  
JACQUELYN HAVER, Save the Children
16. **Formative Research for a School Program on Puberty and Menstrual Hygiene Management (MHM) in Urban and Rural Bangladesh**  
FARHANA SULTANA, icddr,b
17. **Evidence-Based Programming in WaSH and Menstrual Health to Ensure Gender Equality: The Case of RITU in Bangladesh**  
HILDA ALBERDA, Simavi
18. **Stakeholder Perspectives Around Menstrual Hygiene Management in Uganda: Barriers and Key Priorities for the Sector**  
KATHY WOODWARD, RTI International



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19. **Community- and Evidence-Based Approach to Menstrual Hygiene Programming in Ethiopia**  
MOHINI VENKATESH, Save the Children

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  20. **How a Sanitation Program Empowers Women**  
PER LJUNG, East Meets West/Thrive Networks

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  21. **Men's and Boys' Attitudes toward Menstruation and Factors that Influence These Attitudes**  
CHRISTOPHER SEREMET, Catholic Relief Services

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  22. **Unpacking a Nesting Doll: The Layered Challenges of Introducing Menstrual Hygiene Management to Girls' Schools in Afghanistan**  
NASRATULLAH RASA, UNICEF Afghanistan

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  23. **A Systematic Review of Menstrual Hygiene Management Interventions in Populations Comparable to Students of Chicago Public Schools**  
SYDNEY DOE, Feinberg School of Medicine, Northwestern University

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  24. **MHM and WaSH: Supporting a Gender-Responsive Learning Environment**  
MAMITA BORA THAKKAR, UNICEF Pacific and Emory University

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  25. **Menstrual Hygiene Management for the Visually and Hearing Impaired**  
ARCHANA PATKAR, Water Supply and Sanitation Collaborative Council (WSSCC)

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  26. **Menstrual Hygiene Endeavors: Journey from Breaking Silence to Period Power**  
THÉRÈSE MAHON, WaterAid Nepal

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  27. **Population-Level Assessment of Menstrual Hygiene Management Practices in Rajasthan, India**  
ALEXANDRA SHANNON, Bill & Melinda Gates Institute for Population and Reproductive Health

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  28. **Advancing the MHM Agenda in Partnership with School-Based Personnel: Describing MHM Familiarity and Engagement in Rural Kenya**  
LEAH C. NEUBAUER, Northwestern University

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  29. **WinS4Girls: Learning from 14 Countries**  
BROOKE YAMAKOSHI, UNICEF

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  29. **A Pilot Project: Training of Trainers for Girls' & Women's Health Empowerment in Kasese District, Uganda**  
ELIZABETH BECKER, Wandering Minds LLC
- 

## WEDNESDAY OCT. 18

### SANITATION

1. **The Role of Social Capital and Collective Action Failure in Determining Shared Latrine Management Processes: Findings from a Shared Sanitation Intervention in Maputo, Mozambique**  
TESS SHIRAS, ABT Associates

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  2. **Evaluation of Five Chromogenic Clinical Diagnostic Culture Media for Direct Detection and Enumeration of Antimicrobial Resistant *E. coli* in Surface Water and Sewage**  
ANDREW KOLTUN, University of North Carolina–Chapel Hill

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  3. **SaniPath Assessment of Exposure to Fecal Contamination in Informal Settlements and Formal Neighborhoods of Siem Reap, Cambodia**  
JAMIE GREEN, Emory University

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  4. **Shit Flow Diagrams and System Dynamics: Moving Beyond the Snapshot**  
NICHOLAS VALCOURT, University of Colorado–Boulder

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  5. **Occurrence of Human and Avian Fecal Contamination in Urban Mozambican Households: Assessing Fecal Transmission in the MapSan Trial**  
DAVID HOLCOMB, University of North Carolina–Chapel Hill

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  6. **The Need for Fecal Sludge Management among the Poorest: Evidence from Demographic and Health Survey Data**  
DAVID BERENDES, Georgia Institute of Technology
-

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7. **Water and Sanitation Services in Dispersed Rural Areas of Honduras**  
ANDRÉS GIL, IRC
- 
8. **The Role of Social Capital and Sense of Ownership in Rural Community-Managed Water Systems: Qualitative Evidence from Ghana, Kenya and Zambia**  
EMMA KELLY, University of North Carolina–Chapel Hill
- 
9. **Measuring Sanitation Quality with the Healthy Sanitation Framework: Development of a General Theoretical Framework for Sanitation and Operationalizing a Measure for Peri-Urban Lusaka, Zambia**  
JAMES TIDWELL, LSHTM
- 
10. **Combined Outcome of Three Reviews of CLTSH in Ethiopia**  
JANE BEVAN, UNICEF Ethiopia
- 
11. **Drying Kinetics of Human Feces for Onsite Sanitation**  
KATELYN SELLGREN, RTI International
- 
12. **Assessment of Sanitation-Related Environmental Health Effects in Poor and Rural Households in South Africa**  
RENAY VAN WYK, University of Johannesburg
- 
13. **Household Uptake of the SolarBag Technology in Bellavista, Perú: A Qualitative Study to Inform Government Approaches**  
CAMILA BOYNTON, CARE
- 

## DRINKING WATER QUALITY

- 
14. **Open-Source Technology for Water-Quality Monitoring: Opportunities and Challenges**  
CHRIS KELLEY, Johns Hopkins University
- 
15. **Comparison of Analytical Techniques to Explain Variability in Stored Drinking Water Quality and Microbial Hand Contamination of Female Caregivers in Tanzania**  
ANGELA HARRIS, Stanford University
- 
16. **Establishing a Drinking Water Safety Strategy in Mid-Western Nepal**  
ARIANE SCHERTENLEIB, Eawag
- 
17. **The Effects of Periodic Abandonment on the Reactivation of Biosand Filters on a School Schedule**  
BARBARA STEWART, Bowdoin College
- 
18. **Sources of Fluoride Intake and Risks to Human Health: The Cases of Four Villages in Oromia and SNNPR Regions of Ethiopia**  
BELAY SIYOUN LEGGESSE, Ministry of Water, Irrigation and Electricity
- 
19. **Household Water Chlorination Reduces Incidence of Diarrhea among under-Five Children in Rural Eastern Ethiopia: A Cluster Randomized Controlled Trial**  
BEZATU ALEMU, Haramaya University
- 
20. **Manganese Removal from Drinking Water in Selected Rural Areas in Bangladesh: An Action Research**  
BOLUWAJI ONABOLU, UNICEF Bangladesh
- 
21. **The Associations Between Drinking Water Source, Enteropathogen Prevalence in Child Stools and Child Growth in Rural Communities in Limpopo Province, South Africa.**  
BRIDGETTE MCCARTY, University of Virginia's College at Wise
- 
22. **Water Ambassador Program II: Furthering the Understanding and Protection of Watersheds and Hydrology in the U.S. Virgin Islands**  
CHRISTINA CHANES, Cooperative Extension Service
- 
23. **Virus Removal by Chitosan Coagulation Pretreatment in Natural Waters to Optimize Ceramic Water Filtration for Household Drinking Water Treatment**  
COLLIN KNOX COLEMAN, The Water Institute
- 
24. **Scaling Laws Governing Contaminant Intrusion in Intermittent Water Supplies**  
DAVID TAYLOR, Massachusetts Institute of Technology
-



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25. **Safely Managed Intermittent Water Supplies? New Evidence from New Delhi**  
DAVID TAYLOR, Massachusetts Institute of Technology
- 
26. **A Continuous, Objective Metric for the Usage of Household Water Treatment and Safe Storage Devices**  
DAVID TAYLOR, Massachusetts Institute of Technology
- 
27. **Health and Environmental Impact of SODIS in Uganda**  
GREGOR RISS, Helioz
- 
28. **The Extended Laboratory Use of Ceramic Water Filters with Antimicrobial Silver Ion Technology**  
JONATHAN MUSOR, Bangor High School
- 
29. **Field Experiences in Removing Fluoride from Water Using Synthetic Apatite Medium Produced and Applied in Kenya**  
JULIUS KUBAI, Nakuru Defluoridation Company
- 
30. **Impact of Human Movement along an Urban–Rural Gradient on Diarrhea and Pathogen–Specific Diarrhea Risk: Case Control Study in Ecuador, 2014–2015**  
SHANON SMITH, Rollins School of Public Health, Emory University
- 

## SYSTEMS

- 
31. **Water Safety Plan Review and Approval in the Philippines**  
JOSELITO RIEGO DE DIOS, Philippine Department of Health
- 
32. **Pathways to Sustainability: A Fuzzy–Set Qualitative Comparative Analysis of Rural Water Supply Programs**  
SARA MARKS, Eawag
- 
33. **Integrating CLTS and SanMark: A Solid Lever for Behavior Change in the Ivorian Context**  
JEAN-MARC LEBLANC, FRC
- 
34. *See Thursday, #37*
- 
35. **Need in Kenya for a Major Scaling Up to Meet SDGs**  
MARK REIMERS, Waterlines Santa Fe, New Mexico
- 
36. **Willingness-to-Pay for Sanitation Surcharges in Kenya**  
RANJIV KHUSH, Aquaya Institute
- 
37. **Barriers and Opportunities for Achieving Safe Drinking Water in Bangladesh: A System Thinking Approach**  
GRACE RODRIGUEZ, University of Michigan
- 
38. **Improved Functionality of Water Systems: How Solar Power Increases Resilience to Drought in Somali Villages**  
KAMAL FARAH, CARE
-

## TREATMENT AND FILTRATION

1. **Scaling up Strategies for Household Water Treatment and Storage in Ghana**  
KWEKU QUANSAH, Ministry of Sanitation and Water Resources
2. **Rapid Drinking Water Safety Estimation in Cities: Piloting a Globally Scalable Method in Cochabamba, Bolivia**  
LUCAS ROCHA MELOGNO, Duke University
3. **Ceramic Pot Filter Effectiveness for Drinking Water Treatment: a Systematic Review**  
JUSTINE RAYNER, Tufts University
4. **Management, Finance and Effective Use in a Household Water Treatment and Safe Storage Program in Peru**  
CAROLINE FOSTER, Water Mission
5. **Microbiological Effectiveness and Consistent Use within Pilot Trials of New Household Water Treatment Options**  
ANNA MURRAY, Tufts University

## MICROBIAL AND VIRAL CONTAMINANTS

6. **Oral Cholera Vaccine: Everything You Need to Know**  
ANNE BALLARD, Johns Hopkins Center for Communication Programs
7. **Integration of Oral Cholera Vaccine and WaSH Interventions: Findings from a Literature Scan**  
ANNE BALLARD, Johns Hopkins Center for Communication Programs
8. **Effects of Ebola Preventing Interventions on Psychosocial Factors of the RANAS Model**  
ANNA GAMMA, Eawag
9. **Prevalence of Free-Living Amoebae in Households, Farming and Health Care Potable Water of South Africa**  
PETROS MUCHESA, University of Johannesburg
10. **Shining a Light on Microbial Contamination Risk: How In-Situ Fluorimetry Can Improve Assessment of Groundwater Supplies**  
KATRINA CHARLES, University of Oxford

## EVIDENCE TO ACTION

11. **Water Governance Self-Assessments: Providing a Road Map for Action**  
ADAM KEOUGH, Catholic Relief Services
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The **Osprey Foundation** strives to empower individuals and communities through education, health, economic opportunity and human rights in a sustainable way. Osprey's water, sanitation and hygiene (WaSH) program has three main elements: 1) Supporting systems change that provides sustainable access to WaSH services at scale; 2) Seeding innovative models for delivering WaSH services to the poor; and 3) Advocating for change within the sector through collaboration and a focus on leveraged impact. Osprey supports select WaSH initiatives, NGOs and social ventures with grants, impact investments and expert advice on strategy, funding and operations. It focuses its WaSH program in sub-Saharan Africa, Latin America and the Middle East.



## GOLD

The **P&G Children's Safe Drinking Water** program consists of not-for-profit social marketing and emergency relief efforts to provide P&G packets in the developing world with private, public, and NGO partners. Our goal is to reduce sickness and death in children that results from drinking contaminated water.



**Watermill Express** is the largest drive-up pure drinking water and ice company in the nation and the green alternative to prepackaged water. Watermill Express customers reuse their own clean containers to reduce pollution from single-use plastic water bottles. Watermill Express is also the founding partner of Clean Water Here which created the largest social media awareness campaign on safe drinking water in U.S. history.



**World Vision**, the leading NGO providing clean drinking water in the developing world, is a Christian humanitarian organization dedicated to helping children and communities reach their full potential by tackling the causes of poverty and injustice. We work in nearly 100 countries, serving all people, regardless of religion, race, ethnicity or gender.



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**The International Association of Plumbing and Mechanical Officials** has been protecting the public's health and safety for more than eighty years. The IAPMO Group is a complete service organization, providing leadership towards the development of consensus based sustainable water and energy code provisions, leading educational programs, and a manufacturer-preferred 3rd party certification program.



As a leading manufacturer in the plumbing industry, KOHLER is bringing its expertise to work with WaSH partners in designing and delivering the aspirational, affordable products people want but to which they lack access. **KOHLER Clarity**—a ceramic water filter based on PATH's C1 interface—is KOHLER's first BOP product.



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The staff and programs of the **African Studies Center** work to provide the University and the people of North Carolina with a campus hub for interdisciplinary inquiry and communication on Africa, including the sponsorship of a wide variety of activities that bring together interested faculty and students from a large number of academic disciplines, focusing on the interconnected issues of political change, expressive culture, gender, sustainability, health and Islam.



The WATA® technology developed by **Antenna Foundation** enables the local production of sodium hypochlorite for marginalized populations in developing countries. WATA® solution can be used for water treatment or disinfection.



**Aqua Research** provides innovative technology solutions to serve the water needs of mankind. The low cost H2gO personal purifier uses salt to provide a family ten years of safe water.



Founded in 1943, **Catholic Relief Services** (CRS) is the official international humanitarian agency of the Catholic community in the United States. Our mission is to serve the poorest and most vulnerable on the basis of need, not creed.



**NSF International** is a global independent organization that writes standards, and tests and certifies products for the water, food and health care industries and is committed to protecting human health and safety worldwide.



Independent development publisher **Practical Action Publishing** distributes and publishes books and journals on international development policy and practice, including humanitarian emergencies, WaSH, agriculture, social enterprise, environment, climate change and energy.



**Sawyer Products** works to simplify water filtration by providing complete systems customized to meet the ever-changing needs NGOs face. We offer sustainable solutions which are field proven.



**Tomlinson Industries** is a leading manufacturer of faucets for water dispensing. Our faucets are used around the world and in third-world countries to provide clean, filtered water.



**Aquagenx** portable water quality testing products are ideal for on-site testing in low resource, rural and disaster areas, ongoing water quality monitoring and for targets in Sustainable Development Goal 6.



**Aquatabs & Aquatabs Flo**—water technology that delivers access to safe, clean drinking water with the drop of a tablet or easily installed water treatment system.



**MSR Global Health** is a leading innovator and manufacturer of low-cost, field-proven products that improve access to basic human needs for people living in low-resource communities around the world.



**Plan International USA** is part of a global network that works in partnership with donors, children, and communities in more than 50 developing countries to end the cycle of poverty.



**RTI International** is an independent, nonprofit research institute dedicated to improving the human condition. Clients rely on us to answer questions that demand an objective and multidisciplinary approach. We believe in the promise of science, and we are inspired every day to deliver on that promise for the good of people, communities, and businesses around the world.



Billions of people don't have access to safe drinking water or hygienic sanitation. Let's change that. **SNV** provides innovative WaSH solutions in 30 developing nations. Join us at [www.snv.org](http://www.snv.org).



The **UNC Institute for the Environment** is Carolina's campus-wide environmental research, education and outreach unit.





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## Water Microbiology 2018

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# Agenda For Change

Agenda For Change aims to contribute to achieving universal access to sustained services by

- applying a systems approach to WaSH;
- supporting the sector in countries from district to national level;
- testing and demonstrating approaches; and
- bringing learning from the district to national and global levels for scaling-up.

Learn more at  
[www.washagendaforchange.net](http://www.washagendaforchange.net)

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