



AMCA

89TH ANNUAL MEETING

RENO, NEVADA

FEBRUARY 27 – MARCH 3, 2023



To learn more about Altosid XR-G® Ultra,
visit us at booth 317.

**MADE CLEAN.
MADE EASY-TO-USE.
MADE FOR YOU.**

MOSQUITO MANAGEMENT BUILT FOR EXTENDED CONTROL.

Altosid XR-G® Ultra is a carbon-free, clean granular larvicide that's easy on equipment and provides effective, flexible larval control for up to 28 days. That means professionals can have reliable control with fewer applications - an excellent choice for unmanned aircraft systems. Powered by (S)-methoprene, Altosid XR-G® Ultra provides environmentally compatible mosquito control made for professionals focused on maintaining public health.

 **Altosid XR-G® ULTRA**

 **CENTRAL
LIFE SCIENCES**

Altosid XR-G is a registered trademark of Wellmark International.
©2023 Wellmark International



AMCA 89th Annual Meeting At-A-Glance

Mon Feb 27	8:00am–3:00pm	Pre-Conference Workshop: Young Professional (Sierra)				
		Pre-Conference Workshop: Pesticide Resistance Needs Assessment (Invite Only)				
	10:00am–6:30pm	Registration (Grand Salon)				
	1:00pm–5:00pm	Speaker Ready Room (Grand Salon)				
	1:00pm–5:00pm	Committee Meetings (Ruby 2, Ruby 1, Teton 2, Teton 1)				
	2:00pm–4:00pm	Poster Set-up (Summit Pavilion)				
5:00pm–8:00pm	Grand Opening of the Exhibit Hall and Welcome Reception - Badge Required for Entry (Summit Pavilion)					
Tues Feb 28	6:30am–5:30pm	Registration (Grand Salon)				
	7:00am–5:30pm	Speaker Ready Room (Grand Salon)				
	6:30am–7:45am	Welcome Breakfast (Tahoe)				
	8:00am–12:00pm	Plenary Session (Reno)				
	10:00am–10:45am	Refreshment Break (Summit Pavilion)				
	12:00pm–1:45pm	Exhibits Open - Lunch (Summit Pavilion)				
	1:45pm–3:15pm	Mosquito Lightning Symposium (Carson 1)	Social Media & Moquito Control Symposium (Carson 3)	Special District: Perspectives of Trustees and Commissioners Symposium I (Carson 4)	Legislative & Regulatory Symposium I (Crystal 1)	Student Competition I (Crystal 3)
	3:15pm–4:00pm	Refreshment Break in Exhibit Hall/Ice Cream Social - Badge Required (Summit Pavilion)				
	4:00pm–5:30pm	Factors Allowing for the Transmission of Vecotr - Borne Viruses Symposium (Carson 1)	Latin American Student Competition (Carson 3)	Special District: Perspectives of Trustees and Commissioners Symposium I (Carson 4)	Legislative & Regulatory Symposium II (Crystal 1)	Student Competition II (Crystal 3)
	5:45pm–7:15pm	Latin American Discussion (Carson 3)				
Wed March 1	7:30am–5:30pm	Registration (Grand Salon)		Speaker Ready Room (Grand Salaon)		
	8:00am–2:00pm	Education Day (Off-Site Event)				
	8:15am–12:30am	Trustee/Commissioner Tour (Off-Site Event) Badge Required				
	8:30am–10:00am	Next-Generation Genetic and Biological Approaches to Aedes Control: SIT and Beyond Symposium I (Carson 1)	Remembering William (Bill) E. Walton Symposium I (Carson 3)	Novel Adulticide Space Spray: A Decade of Innovation Symposium I (Carson 4)	Insecticide Resistance - Building a Program Step by Step Symposium I (Crystal 1)	National perspective into treatment thresholds for mosquito management Symposium I (Crystal 3)
	10:00am–10:45am	Refreshment Break in Exhibit Hall (Summit Pavilion)				
	10:45am–12:15pm	Next-Generation Genetic and Biological Approaches to Aedes Control: SIT and Beyond Symposium II (Carson 1)	Remembering William (Bill) E. Walton Symposium II (Carson 3)	Novel Adulticide Space Spray: A Decade of Innovation Symposium II (Carson 4)	Insecticide Resistance - Building a Program Step by Step Symposium II (Crystal 1)	National perspective into treatment thresholds for mosquito management Symposium II (Crystal 3)
	12:15pm–1:45pm	Poster Session - Lunch (Summit Pavilion)				
	12:15pm–4:00pm	Exhibits Open (Summit Pavilion)				
	12:30pm–1:30pm	Trustee Luncheon (Nevada 4-5)				
	1:45pm–3:15pm	Resist the urge to panic: Managing resistance in field operations Symposium I (Carson 1)	Overview of Applied Research Programs at the District/Program Level Symposium I (Carson 3)	Young Professionals Symposium I (Carson 4)	Using NASA Satellite Data to Complement Vector Control Practices Symposium (Crystal 1)	West Nile virus and other arthropod-borne pathogens in Arizona Symposium I (Crystal 3)
	3:15pm–4:00pm	Refreshment Break in Exhibit Hall (Summit Pavilion)				
	4:00pm–5:30pm	Resist the urge to panic: Managing resistance in field operations Symposium II (Carson 1)	Overview of Applied Research Programs at the District/Program Level Symposium II (Carson 3)	Young Professionals Symposium II (Carson 4)	Spatial Repellents Symposium (Crystal 1)	West Nile virus and other arthropod-borne pathogens in Arizona Symposium II (Crystal 3)
5:30pm–6:30pm	Young Professionals Social (Sierra 1)					
6:30pm–7:30pm	Past Presidents Reception (Hotel Suite)					
Thurs March 2	7:30am–3:30pm	Registration (Grand Salon)				
	7:30am–4:00pm	Speaker Ready Room (Grand Salon)				
	8:30am–10:45am	Exhibits Open (Summit Pavilion)				
	8:30am–10:00am	9th Annual Arthropod Vector Highlights Symposium (Carson 1)	UAS in Mosquito Control Symposium (Carson 3)	Aerial Applications: Nuts and Bolts Discussion on Mosquito Control Operations Symposium I (Carson 4)	Behavior/Biology I (Crystal 1)	The Results Are In: National, Regional, and Local Vector Control Capacity and Needs Symposium (Crystal 3)
	10:00am–10:45am	Refreshment Break in Exhibit Hall (Summit Pavilion)				
	10:45am–12:15pm	Aquatic plant-associated mosquitoes Symposium (Carson 1)	Operations (Carson 3)	Aerial Applications: Nuts and Bolts Discussion on Mosquito Control Operations Symposium II (Carson 4)	Behavior/Biology II/ Adult Control I (Crystal 1)	Innovative Products and Technologies for Mosquito Control Symposium (Crystal 3)
	12:15pm–1:45pm	Lunch On Own				
	1:45pm–3:15pm	Larval Control/New Product Trials I (Carson 1)	Latin American Symposium I (Carson 3)	Transforming surveillance and control effort using GIS/RS Symposium (Carson 4)	Adult Control II/Systematics (Crystal 1)	Disease/Vector Studies I (Crystal 3)
	3:15pm–3:45pm	Refreshment Break (Grand Salon)				
		Public Relations (Carson 1)	Latin American Symposium II (Carson 3)	New Product Trials II/Other (Carson 4)	Education/Genetics (Crystal 1)	Disease/Vector Studies II (Crystal 3)
6:00pm–7:00pm	Pre-Banquet Social (Grand Salon)					
7:00pm–9:00pm	Banquet (Reno) Badge Required					
Fri March 3	8:30am–9:30am	AMCA Annual Members Meeting (Crystal 3)				
	9:30am–12:30pm	Board of Directors Meeting (Crystal 1)				

Meeting Adjourns – See you in Dallas, TX in 2024

AMCA 2023 TABLE OF CONTENTS

INTRODUCTION	iii
Message from the President	iii
AMCA 2022-2023 Board of Directors	iv
AMCA 2022-2023 Committee Chairs	vi
Planning Committees	viii
Meeting Sponsors	ix
Exhibitor Directory	xii
General Information	xvi
MONDAY SCHEDULE	1
TUESDAY PLENARY SESSION	3
TUESDAY AFTERNOON SESSION 1	4
Legislative and Regulatory - Endangered Species Act and Mosquito Control Product Use Requirements: Know the Process Symposium I	4
Mosquito Lightning Symposium	4
Social Media and Mosquito Control	5
Special District: Perspectives of Trustees and Commissioners Symposium I	6
Student Competition I	6
TUESDAY AFTERNOON SESSION 2	7
Factors Allowing for the Transmission of Vector-Borne Viruses: Vector Competence, Vertebrate Host Competence, and Environmental Factors Symposium	7
Latin American Student Competition	8
Legislative and Regulatory - Endangered Species Act and Mosquito Control Product Use Requirements: Know the Process Symposium II	8
Special District: Perspectives of Trustees and Commissioners Symposium II	9
Student Competition II	9
WEDNESDAY MORNING SESSION 1	11
Insecticide Resistance - Building a Program Step by Step Symposium I	11
National perspective into treatment thresholds for mosquito management Symposium I	11
Next-Generation Genetic and Biological Approaches to Aedes Control: SIT and Beyond Symposium I	12
Novel Adulticide Space Spray: A Decade of Innovation Symposium I	12
Remembering William (Bill) E. Walton - aquatic ecologist, vector ecologist, leader, colleague, and friend Symposium I	13
WEDNESDAY MORNING SESSION 2	14
Insecticide Resistance - Building a Program Step by Step Symposium II	14
National perspective into treatment thresholds for mosquito management Symposium II	14
Next-Generation Genetic and Biological Approaches to Aedes Control: SIT and Beyond Symposium II	15
Novel Adulticide Space Spray: A Decade of Innovation Symposium II	15
Remembering William (Bill) E. Walton - aquatic ecologist, vector ecologist, leader, colleague, and friend Symposium II	16
POSTER SESSION	16
WEDNESDAY AFTERNOON SESSION 1	18
Overview of Applied Research Programs at the District/Program Level Symposium I	18
Resist the urge to panic: Managing resistance in field operations	19
Using NASA Satellite Data to Complement Vector Control Practices Symposium	19
West Nile virus and other arthropod-borne pathogens in Arizona: Surveillance and mitigation strategies Symposium I	20
Young Professional Symposium I	20
WEDNESDAY AFTERNOON SESSION 2	21
Overview of Applied Research Programs at the District/Program Level Symposium II	21
West Nile virus and other arthropod-borne pathogens in Arizona: Surveillance and mitigation strategies Symposium II	21
Young Professional Symposium II	22
Resist the urge to panic: Managing resistance in field operations Symposium II	23
Spatial Repellents Symposium	23

THURSDAY MORNING SESSION 1	25
9th Annual AMCA Arthropod Vector Highlights Symposium	25
Aerial Applications: Nuts and Bolts Discussion on Mosquito Control Operations Symposium I	25
Behavior/Biology I	26
The Results Are In: National, Regional, and Local Vector Control Capacity and Needs Symposium	26
UAS in Mosquito Control Symposium	27
THURSDAY MORNING SESSION 2	28
Aerial Applications: Nuts and Bolts Discussion on Mosquito Control Operations Symposium II	28
Aquatic plant-associated mosquitoes Symposium	28
Behavior/Biology II/Adult Control I	29
Innovative Products and Technologies for Mosquito Control Symposium	30
Operations	30
THURSDAY AFTERNOON SESSION 1	31
Adult Control II/Systematics	31
Disease/Vector Studies I	32
Larval Control/New Product Trials I	33
Latin American Symposium I	34
Transforming surveillance and control effort using GIS/RS Symposium	35
THURSDAY AFTERNOON SESSION 2	36
Disease/Vector Studies II	36
Education/Genetics	36
Latin American Symposium II	37
New Product Trials II/Other	38
Public Relations	39
FRIDAY MORNING SESSION	41
AMCA Annual Member Meeting	41
RESOURCES	42
Author Index	42
Exhibit Hall Map	55
Exhibitor Key	55
Meeting Space Map	56

HOW TO READ THE PROGRAM

Day and Date at top of each page

Start – End Time	MORNING OR AFTERNOON
-------------------------	-----------------------------

Symposium/Session Title

Organizer/Moderator: Name

Start Time – End Time

Room Location

*(may be different from
start-end time in main
heading, check each
symposium/session)*

Time Abstract # Presentation Title

Presenter, Other Author(s)

Time Abstract # Presentation Title

Presenter, Other Author(s)

And so on...

A number preceded by a PL indicates a plenary session talk;

A number preceded by a P- indicates a poster;

All other numbers are oral presentations.

If there is no number listed, there is no abstract associated with that presentation.

Speaker and other authors are found in the program book **author index**.

All author affiliations are listed in the **online abstract book** (Available online in PDF).

Maps to meeting locations and exhibitors are on the last pages of the program book.

INTRODUCTION

MESSAGE FROM THE PRESIDENT

DENNIS WALLETTTE

It is my great pleasure to welcome you to Reno! You are in store for an amazing meeting.

Rui-De Xue, AMCA Vice President, has arranged a terrific program this year, and I think you will agree that he did a truly outstanding job. There are a whopping 327 oral presentations this year and 25 symposia—both of which are up significantly from last year. We also have the much-requested return of a dedicated Trustee Symposium. On top of that, we have 25 posters. So, buckle up! We have a very full program for you this week

I want to offer my sincere thanks to all the symposium organizers and all our presenters. I appreciate all your work. Without you, there would be no meeting. Special recognition goes to Kristen Healy and Casy Crockett for organizing the Student Competition, Mahmood Nikbakhtzadeh for organizing the poster session, Catalina Alfonso-Parra for organizing the Latin American Symposia including the Latin American Student Competition, and Chloe Wang and Kyndall Braumuller for coordinating the activities for AMCA's Young Professionals. I also need to recognize Priscilla Matton for single-handedly making all the arrangements for the Trustee Tour. These volunteer efforts are invaluable and make this association something special.

A heartfelt thank you to the team at Advocacy & Management Group (AMG) for all their work in making this meeting happen, but special thanks to Megan MacNee, our Executive Director, and Natalie Perry, our Events Manager. The amount of work that goes into pulling off a meeting like this and planning every detail associated with it is enormous. You have my thanks and appreciation.

Please take time to explore the exhibit hall and visit our vendor booths. These industry partners are a key component of our association and our annual meeting. Time spent talking with our exhibitors and exploring their latest innovations is time well spent indeed. Our sponsors and exhibitors are why our annual meetings are so memorable, so please thank them for all they do for us. A special shout-out to the vendors who generously provided 11 stipends for the Young Professionals' travel fund.

The Grand Sierra is almost a city in itself, and you will find a myriad of entertainment options available to you. If you enjoy games of chance, the casino floor is large and provides many ways to test your luck. However, if that is not your thing, there is a movie theater, a bowling alley (with 50 lanes!), an escape room, laser tag, and much, much more. There are also many dining options—from casual dining all the way to a high-end steak restaurant. All those options are available without leaving the property. If you want to venture outdoors, beautiful Lake Tahoe is nearby, and the National Automobile Museum is in Reno. I recommend both if your schedule permits.

While you are here, it is my fervent hope that you will gain some knowledge, share some knowledge, rekindle old friendships, forge some new ones, and have some fun in the process. Let the good times roll! Or, as we say in Louisiana, *laissez les bon temps rouler!*

Dennis Walette, AMCA President

AMCA 2022-2023 BOARD OF DIRECTORS

PRESIDENT

Dennis Wallete

Tangipahoa Mosquito Abatement
District
15483 Club Deluxe Road
Hammond, LA 70403
Phone: 985-543-0454
dennis@tangimosquito.org

PRESIDENT ELECT

Kristen Healy, PhD

Louisiana State University
404 Life Sciences Building
Department of Entomology
Baton Rouge, LA 70803
Phone: 225-578-7386
khealey@lsu.edu

VICE PRESIDENT

Rui-De Xue, PhD

Anastasia Mosquito Control
District
120 EOC Drive
Saint Augustine, FL 32092
Phone: 904-471-3107
xueamcd@gmail.com

PAST PRESIDENT

Mark Breidenbaugh, PhD

Northwest Mosquito and Vector
Control District
1966 Compton Avenue
Corona, CA 92881
Phone: 951-340-9792
mbreidenbaugh@
northwestmecd.org

TREASURER

Gary Hatch

Davis County Mosquito
Abatement
85 North 600 West
Kaysville, UT 84037
Phone: 801-544-3736
ghatch@davismosquito.org

INDUSTRY DIRECTOR

Broox Boze, PhD

Vector Disease Control
International
1320 Brookwood Drive
Little Rock, AR 72202
Phone: 956-459-1593
bboze@vdc.i.net

INTERNATIONAL DIRECTOR

Catalina Alfonso-Parra, PhD

Max Planck Tandem Group
Mosquito Reproductive Biology
– Universidad de Antioquia
Instituto Colombiano de Medicina
Tropical
Complejo RutaN, Calle 67 No 52-
20 Lab 4-46
Medellin, Columbia
Phone: +57 322-2239631
catalfonso@gmail.com

MID-ATLANTIC DIRECTOR

Michael Doyle

North Carolina Department of
Health and Human Services
1902 Mail Service Center
Communicable Disease Branch
Raleigh, NC 27699
Phone: 919-546-1637
Michael.doyle@dhhs.nc.gov

NORTH ATLANTIC DIRECTOR

Priscilla Matton

Bristol County Mosquito Control
38 Forest St.
Attleboro, MA 02703
Phone: 508-823-5253
brismosqpc@comcast.net

NORTH CENTRAL DIRECTOR

Mark Clifton, PhD

North Shore Mosquito Abatement
District
117 Northfield Road
Northfield, IL 60093
Phone: 847-446-9434
mclifton@nsmad.com

NORTH PACIFIC DIRECTOR

Gregory Barron

North Morrow Vector Control
District
PO Box 192
Boardman, Oregon 97818
Phone: 541-491-6082
gbarron@centurytel.net

SOUTH ATLANTIC DIRECTOR

Robert Cartner

Beaufort County Mosquito Control
84 Shanklin Rd
Beaufort, SC 29906
Phone: 843-255-5733
rcartner@bcgov.net

SOUTH CENTRAL DIRECTOR

Herff Jones

Iberia Parish Mosquito Control
611 Old Central Taxiway
New Iberia, LA 70560
Phone: 337-365-4933
hjones@iberiagov.net

SOUTH PACIFIC DIRECTOR

Gary Goodman

Sacramento-Yolo Mosquito and
Vector Control District
8631 Bond Road
Elk Grove, CA 95624
Phone: 916-685-1022
gwgoodman@fightthebite.net

WEST CENTRAL DIRECTOR

Levi Zahn, PhD

Williston Vector Control District
P.O. Box 17
Williston, ND 58802
Phone: 701-577-4563
LeviZ@co.williston.nd.us

TECHNICAL ADVISOR

Daniel Markowski

American Mosquito Control
Association
Phone: (662) 822-1270
AMCA.TA@mosquito.org

**SOCIAL MEDIA
COORDINATOR**

Mary-Joy Coburn

Greater Los Angeles County
Vector Control District
12545 Florence Ave.
Santa Fe Springs, CA 90670
Phone: 562-758-6510
mjcoburn@glacvcd.org

AMCA 2022-2023 COMMITTEE CHAIRS

Annual Meeting Committee

Kristen Healy

Program Subcommittee

Rui-De Xue

Archives Committee

Scott Crans

Bylaws & Policy Committee

Janet McAllister

Executive Committee

Dennis Walette

Finance Committee

Gary Hatch

Legislative & Regulatory Committee

Angela Beehler

ESA Subcommittee/ Pollinators Subcommittee

Mark Clifton

Chemical Control Subcommittee

Nina Dacko

Clean Water Act Subcommittee

Gary Goodman

Pesticide Environmental Stewardship Program (PESP) Subcommittee

Gabrielle Sakolsky Hoopes

Washington Conference Subcommittee

Mark Breidenbaugh

Federal Lands Subcommittee

William Meredith

Federal Funding Subcommittee

Gary Goodman

Unmanned Aircraft Systems Subcommittee

Joel Buettner

Membership Committee

Megan MacNee

Nominating / Awards Committees

Mark Breidenbaugh

John N. Belkin Award Subcommittee

Larry Hribar

Industry Award Subcommittee

Broox Boze

Boyd-Ariaz Grassroots Award Subcommittee

Jimmy Lunders

Public Relations Committee

Dan Markowski

Publications Committee

Whitney Qualls

JAMCA Editorial Board

Michelle Brown

Newsletter Editorial Board

Clark Wood

Special Publications Subcommittee

Whitney Qualls

Science & Technology Committee

Jennifer Henke

Training & Member Education Committee

Isik Unlu

Young Professionals Committee

Caroline Gongora, Chair

Kyndall Braumuller & Chloe Wang, Advisors

2023 PLANNING COMMITTEES

ANNUAL MEETING COMMITTEE

Kristen Healy, PhD, *Chair, AMCA President-Elect*

Dennis Walette, *AMCA President*

Rui-De Xue, PhD, *AMCA Vice President*

Broox Boze, PhD, *AMCA Board, Industry Director*

Jillian Meeks, *Education Day Coordinator*

PROGRAM COMMITTEE

Rui-De Xue, PhD, Chair, *AMCA Vice President*

Catalina Alfonso-Parra, PhD, *Co-Chair, Latin American Symposium*

Mark Breidenbaugh, PhD, *Co-Chair, Latin American Symposium*

Mahmood Nikbakhtzadeh, PhD, *Chair, Student Competition, Poster Competition*

AMCA HEADQUARTERS STAFF

Megan MacNee, *Executive Director*

Natalie Perry, *Events Manager*

R'Mani White, *Membership Services Manager*

Theresa Lindroos, *Accounting Manager*

Sarah Spencer, *Digital & Social Media Manager*

Katelyn Peyser, *Publications Manager*

DOWNLOAD THE 2023 ANNUAL MEETING MOBILE APP!

Abstracts, Program, Floor Plans, Exhibitor Lists, Daily Feeds & more on your mobile device – completely free!

- Download the mobile app in the app store by **searching for 'eventScribe'**.
- Once you've found the app, tap either **Get** or **Install**.
- After installing, **a new icon will appear** on the home screen.
- Once downloaded, open the app and **enter AMCA 2023** in the search bar.



MEETING SPONSORS

AMCA is deeply appreciative of and proud to acknowledge the following industry supporters of the 89th Annual Meeting

DIAMOND LEVEL SUPPORTERS



Welcome Reception
Meeting Bags
Program Book Inside Front Cover
Pre-Banquet Social – Drink Ticket
Conference Hallway Monitor Branding
Latin American Student Competition Fund
Banquet Table
Mobile App Sponsor
Student Competition Fund
Young Professional Industry Shadowing Program
Sponsor for Zoe Rodriguez

PLATINUM LEVEL SUPPORTERS



Donut Social
Expo Luncheon
Tuesday Morning Break
Pre-Banquet Social – Drink Ticket
Conference Hallway Monitor Branding
Young Professionals Fund
Banquet Tables
Mobile App Sponsor
Young Professional Industry Shadowing Program
Sponsor for Becky Cloud



Wednesday Morning Break
Ice Cream Social
Latin American Student Competition
AMCA Research Fund
Young Professionals Fund
Young Professionals Social
Student Competition Fund
Conference Hallway Monitor Branding
Banquet Tables
Mobile App Sponsor
Young Professional Industry Shadowing Program
Sponsor for Jillian Meek

GOLD LEVEL SUPPORTERS



Convention Center Elevator Wraps
Student Competition Fund
Latin American Symposium & Competition
Young Professional Dinner
Notepads & Pens
Floor Clings
Banquet Tables
Mobile App Sponsor
Young Professional Industry Shadowing Program
Sponsor for Joanelis Medina Quintana & Atom Rosales

SILVER LEVEL SUPPORTERS



Program Book Back Cover
Banquet Tables
Young Professional Industry Shadowing Program
Sponsor for Nicole Marie Marrero Vazquez



A FAMILY COMPANY

Tuesday Afternoon Refreshment Break
Expo Lunch Sponsor
Young Professionals Fund
Banquet Tables

BRONZE LEVEL SUPPORTERS



Badge Holders
Floor Clings
AMCA Research Fund
Banquet Tables
Young Professionals Industry Shadowing Program
Sponsor for Carla-Cristina Melo Edwards

BRONZE LEVEL SUPPORTERS (Cont.)



Wednesday Afternoon Refreshment Break
Floor Clings
Young Professionals Fund
Banquet Tables



Program Book Inside Back Cover
Conference Hallway Monitor Branding
Floor Clings
Banquet Tables
Young Professionals Industry Shadowing Program
Sponsor for Jessica Bushnell



Mobile App Sponsor
Conference Hallway Monitor Branding
Floor Clings
Young Professionals Group Fund
Latin American Symposium Fund
Banquet Tables



Audio Visual Sponsor
Mobile App Sponsor
Banquet Tables

EVENT SUPPORTERS

BVA

Mobile App Sponsor

Leading Edge

Young Professionals Industry Shadowing Program
Sponsor for Joshua Lassen

Environmental Security Pest Control

Young Professionals Industry Shadowing Program
Sponsor for Corey Day

The Mosquito BEAONS Working Group

YP Travel Stipend

AMCA SUSTAINING MEMBERS

AMCA would like to thank the 2022/2023 sustaining members. A full list of current sustaining members is accessible at:

<https://www.mosquito.org/page/sustainmemberlist>

EXHIBITOR DIRECTORY

BOOTH NO.

A1 Mist Sprayers 110 W 3rd Street Ponca, Nebraska 68770-0517 https://mistsprayers.com/	123
Azelis Agricultural & Environmental Solutions 1324 North Hearne Avenue Ste 120 Shreveport, Louisiana 71107 https://www.AzelisAES-US.com	207
AGNAV INC 30 Churchill Drive Barrie, Ontario L4N8Z5 https://www.agnav.com	401
AMCA Young Professionals One Capitol Mall, Ste 800 Sacramento, California 95814 https://amcayps.wordpress.com/	220
AMGUARD Environmental Technologies 5151 McCrimmon Parkway Ste 275 Morrisville, North Carolina 27560 https://amguardtech.com	200
Birchmeier/ITB Company, Inc. ITB Company, Inc. 1688 Nevada Avenue London, Kentucky 40743 http://www.birchmeier.us	405
BVA Oils BVA Inc PO Box 930301 Wixom, Michigan 48393 http://www.bva oils.com	111
Central Life Sciences 1501 E Woodfield Rd, Ste 200W Schaumburg, Illinois 60173 https://www.centralmosquitocontrol.com/	317
Clarke 675 Sidwell Court St. Charles, Illinois 60174 http://www.clarke.com	223
Co-Dx 2401 Foothill Dr. Salt Lake City, Utah 84109 https://codiagnostics.com/	107
Diversity & Inclusivity Sub Committee One Capitol Mall, Ste 800 Sacramento, California 95814	500

	BOOTH NO.
EMD Electronics 1200 Intrepid Avenue, Ste 300 Philadelphia PA 19112 www.ir3535.com	312
EntoExchange 3182 Gateway Lane Cantonment, FL 32533 Ensec.net	113
Entomological Society of America 3 Park Place, Ste 307 Annapolis, Maryland 21401	323
Envu 5000 Centregreen Way, Ste 400 Cary, NC 27513 www.envu.com	423
FMC 2929 Walnut Street Philadelphia, PA 19104 www.fmc.com	212
Frontier Precision, Inc. 2716 S Lincoln Ave, Ste G Jerome, Idaho 83338 http://frontierprecision.com/mosquito/	117
GROPRO Corp 900 128th Street W, Unit G Burnsville, MN 55337 www.groproag.com	310
INZECTO Gainesville, FL www.inzecto.com	510
IOX Innovations 431 6th Street NW Hickory, North Carolina 28601 (828) 398-2181	222
Leading Edge 506 Fentress Blvd, Unit B Daytona Beach, Florida 32114 http://www.LeaTeam.com	422
LONDON FOG PO Box 406 505 Brimhall Ave Long Lake, Minnesota 55356 Http://www.Londonfoggers.Com	420
MGK 7325 Aspen Lane North Minneapolis, Minnesota 55428 https://www.mgk.com/	413

	BOOTH NO.
<p>NC State University 1020 Main Campus Drive Raleigh, North Carolina 27606 https://www.ncsu.edu/</p>	504
<p>NPD Products Ltd. 2325 Old Second South Midhurst, Ontario L9X 1P3 https://www.npdproducts.com/us/</p>	213
<p>Oxitec, Ltd. Oxitec 71 Innovation Drive Milton Park Abingdon, UK</p>	202
<p>LAC - Puerto Rico Vector Management Association P.O. Box 363475 San Juan, Puerto Rico 00936-3475 https://prvectorcontrol.org/amvpr/</p>	403
<p>Rad Source 4907 Golden Parkway, Ste 400 Buford, GA 30518 www.radsources.com</p>	121
<p>S.C. Johnson & Son, Inc. 1525 Howe St. Racine, Wisconsin 53403 http://www.scjohnson.com</p>	206
<p>Senecio Robotics Bikat Ha'yareach 4a, Kfar Saba, ZZ 4463107 Israel www.senecio-robotics.com</p>	214
<p>Summit Chemical Company 235 S Kresson St Baltimore, MD 21224 www.summitchemical.com</p>	321
<p>Target Specialty Products 15415 Marquardt Ave Santa Fe Springs, CA 90670 www.target-specialty.com</p>	423
<p>LAC - Texas Mosquito Control Association P.O. Box 906 Hewitt, Texas 76643</p>	512
<p>Valent BioSciences 1910 Innovation Way, Ste 100 Libertyville, Illinois 60048 https://www.valentbiosciences.com/publichealth/</p>	305

Vectech

3600 Clipper Mill Rd, Ste 205
Baltimore, MD 21211
www.vectech.io

105**Vector Disease Control International (VDCI)**

1320 Brookwood Drive, Ste H
Little Rock, Arkansas 72202
<https://www.vdci.net/>

211**VeeMAC**

14301 S 31st Street
Bellevue, Nebraska 86123
<http://veemac.com>

411**Veseris**

10800 Pecan Park Blvd., Ste 300
Austin, Texas 78750
<https://veseris.com/>

103

GENERAL INFORMATION

Registration Hours

Located in the Grand Salon

Monday, February 27	10:00 am – 6:30 pm
Tuesday, February 28	6:30 am – 5:30 pm
Wednesday, March 1	7:30 am – 5:30 pm
Thursday, March 2	7:30 am – 3:30 pm

Speaker Ready Room Hours

Located in Grand Salon

Monday, February 28	1:00 pm – 5:00 pm
Tuesday, February 27	7:00 am – 5:30 pm
Wednesday, March 1	7:30 am – 5:30 pm
Thursday, March 2	7:30 am – 4:00 pm

Exhibit Hall Hours

Located in Summit Pavilion

Set-up:

Monday, February 27	8:00 am – 3:00 pm
---------------------	-------------------

Viewing Hours:

Monday, February 27	5:00 pm – 8:00 pm
Tuesday, February 28	12:00 pm – 1:45 pm 3:15 pm – 4:00 pm
Wednesday, March 1	10:00 am – 10:45 am 12:15 pm – 4:00 pm
Thursday, March 2	8:30 am – 10:45 am

Breakdown:

Thursday, March 2	10:45 am – 4:00 pm
-------------------	--------------------

Poster Presentations

Poster presenters must locate their poster numbers in this program book and place their posters on the assigned poster boards in the exhibit hall. Presenters are required to attend their posters during the Poster Session on Wednesday, March 1 from 12:15 pm-1:45 pm.

Poster Set-up:

Monday, February 27	2:00 pm – 4:00 pm
---------------------	-------------------

Poster Removal:

Thursday, March 2	10:45 am – 1:00 pm
-------------------	--------------------

Posters not removed by 1:00 pm on Thursday will be placed behind the registration desk and will be discarded if not claimed by 11:00 am on Friday.

ADA Requests

AMCA fully complies with the legal requirements of the Americans with Disabilities Act. If any participant of the Annual Meeting is in need of an accommodation, he/she should notify the AMCA registration counter and indicate the type of assistance needed. AMCA cannot ensure the availability of appropriate assistance without prior notice.

Breaks

AMCA will NOT provide coffee prior to the start of morning sessions, so please plan accordingly. Sponsored beverage breaks are offered daily. Please refer to the program for times.

Education Day

The Annual AMCA Education Day is on Wednesday, March 2nd. AMCA Volunteers from the AMCA Education committee will provide programs to students. Students from all grade levels will participate in activities related to mosquitoes and mosquito biology, their habitats, and will have the opportunity to have hands-on experiences with various mosquito and mosquito control related items. For information, please see AMCA registration counter.

Latin American Symposium

The 33rd Annual Latin American Symposium, held on Thursday, has simultaneous English translation of Spanish oral presentations. This is a unique opportunity to learn about mosquito research and control in Latin America. Please see the technician in the back of the room for a headset.

Meals

The Monday reception is NOT a full dinner. The Welcome Networking Breakfast will be served on Tuesday morning and is included in your ticket. Lunch will be served on Tuesday and Wednesday in the Expo Hall. The banquet on Thursday is a full dinner at the 89th Annual meeting.

Meeting Evaluations

The Annual Meeting evaluation will be emailed to all attendees following the meeting. We encourage all attendees to complete the survey so we can continue to improve the AMCA Annual Meeting.

Member Meeting

The Annual Member Meeting is on Friday from 8:30 am – 9:30 am in Carson 3. The member/business meeting updates the membership on AMCA finances and committee activities as well as new initiatives. All members are encouraged to attend.

Moderators

Moderators are required to arrive in their session room at least 10 minutes prior to the start of the session to review the slides, timers, and audio with the AV Staff. Papers must be given at the scheduled times. If a paper is canceled or a speaker does not appear, do not advance to the next speaker, but use the open time for questions and discussion.

Name Badge

A name badge is required for admission to all meeting sessions and the Exhibit Hall. Badges will be scanned at individual functions such as the Reception and Banquet. Drink tickets will be given at registration for the Welcome Reception and Pre-Banquet Social.

Speaker Presentations

Speakers with PowerPoint presentations should have already uploaded their PowerPoint files online. If you have not done so, contact the audiovisual coordinator in the Speaker Ready Room as soon as possible.

Trustee Tour Pick-up

All trustees, commissioners, and their companions should report to the front driveway of the hotel for the bus on Wednesday morning at 8:15 am. Please bring your badge to enter the bus. Bus will return by 12:pm for Lunch at the hotel.

Young Professionals Activities

The AMCA Young Professionals will be hosting numerous events throughout the Annual Meeting. Please see the listing of events below. If you have any questions regarding these activities, please visit the AMCA Young Professionals Booth 220 located in the Exhibit Hall.

Young Professionals Welcome Dinner

This YP-only event is sponsored by Clark and requires a ticket for entry, as space is limited. Visit the YP booth to pick up your ticket (if you've RSVP'd) or to inquire about availability.

Young Professionals Discussion Panel and Career

Round-Table Symposium will be held on Wednesday, March 1 from 1:45 pm - 5:30 pm in Carson 4 meeting room. The symposium will include a panel discussion followed by round-table career discussions with field experts. Check program for more symposium details.

Young Professionals Social will be held on Wednesday, March 1 from 5:30 pm to 6:30 pm in the Sierra 1 meeting room. The event will include a one-hour open bar social and light hors d'oeuvres. The event is sponsored by Valent BioSciences. Check program for more details.

Young Professionals Promo Booth will be hosted in the Exhibit Hall at Booth 220. Come see us during breaks for free games, prizes, and group information. Also, don't forget to bid on our art auction! All proceeds go to the YP Fund.

AMCA RESEARCH FUND

2023 RESEARCH FUND AWARDEES

Emily Mader, “Analysis of perceived risks and benefits of mosquito abatement and personal protection strategies.” Northeast Regional Center for Excellence in Vector-Borne Diseases, Cornell University

Julianne Miranda-Bermúdez, PhD, “Infrastructure to evaluate community engagement efforts for an Integrated Vector Management Program.” Puerto Rico Vector Control Unit

2022 RESEARCH FUND AWARDEES

Michael Reiskind, PhD, “Towards the Mosquito Tricorder: One Stop Determination of Species, Age, Infection Status, and Pathogen Identification” Northern Carolina State University

Joseph McMillan, PhD, “Informative and Real-Time Arbovirus Risk Mapping Based on Surveillance Data Synchrony Estimates” Connecticut Agriculture Experiment Station & Texas Tech University

The AMCA Research Fund (AMCARF) seeks to fund research that will lead to new tools and strategies for mosquito surveillance and control, ultimately protecting the public from mosquito-borne disease and discomfort from mosquito bites.

Contributions to the AMCARF are now being accepted!

The AMCA Research Fund is currently accepting contributions for future research on mosquito control and related topics. Contributions can be made online at <http://www.mosquito.org/researchfund> or by check to:

AMCA Research Fund
One Capitol Mall, Suite 800
Sacramento, CA 95814

AMCA would like to thank the following contributors (since February 23, 2018):

Azelis A&ES
Anonymous Contribution
Canyon County Mosquito Abatement District
Coachella Valley Mosquito and Vector Control District
Contra Costa Mosquito and Vector Control District
Michigan Mosquito Control Association
Sacramento-Yolo Mosquito and Vector Control District
Schools First Federal Credit Union
Valent BioSciences



89TH ANNUAL MEETING

At-A-Glance

Monday, February 27, 2023

MONDAY, FEBRUARY 27

- | | |
|---------------------------|--|
| 10:00 am – 6:30 pm | Registration
<i>Grand Salon</i> |
| 1:00 pm – 5:00 pm | Speaker Ready Room
<i>Grand Salon</i> |
| 1:00 pm – 5:00 pm | Committee Meetings
<i>Ruby 1 & 2, Teton 1 & 2</i> |
| 2:00 pm – 4:00 pm | Poster Set-up
<i>Summit Pavilion</i> |
| 5:00 pm – 8:00 pm | Grand Opening of the Exhibit Hall
and Welcome Reception
<i>Summit Pavilion</i>
(Badge Required for Entry) |

MONDAY, FEBRUARY 27

**8:00 AM - 3:00 PM Pre-Conference Workshop:
Pesticide Resistance Needs
Assessment** *(Invite Only)*

**8:00 AM - 3:00 PM Pre-Conference Workshop: Young
Professionals** *(Invite Only)*
Meeting Room: Sierra

1:00 PM - 5:00 PM Committee Meetings

2:00 PM - 3:30 PM JAMCA & Publications Committee
Meeting
Ruby 2

2:00 PM - 3:30 PM Science & Technology Committee
Meeting
Teton 2

2:30 PM - 3:30 PM Membership Committee Meeting
Ruby 1

3:30 PM - 4:30 PM SIT Subcommittee Meeting
Teton 2

4:00 PM - 5:00 PM Bylaws Committee Meeting
Teton 1

4:00 PM - 5:00 PM Finance Committee Meeting
Ruby 1

4:00 PM - 5:00 PM Public Relations Committee Meeting
Ruby 2

**5:00 PM - 8:00 PM Grand Opening of Exhibit Hall &
Welcome Reception**
Summit Pavilion
Sponsored By Central Life Sciences



89TH ANNUAL MEETING

At-A-Glance

Tuesday, February 28, 2023

TUESDAY, FEBRUARY 28

6:30 am – 5:30 pm

Registration

Grand Salon

7:00 am – 5:30 pm

Speaker Ready Room

Grand Salon

6:30 am – 7:45 am

Welcome Networking Breakfast

Tahoe

8:00 am – 12:00 pm

Plenary Session

Reno

10:00 am – 10:30 am

Refreshment Break

Summit Pavilion

12:00 pm – 1:45 pm

Exhibits Open

Lunch Available

Summit Pavilion

1:45 pm – 3:15 pm

Afternoon Sessions

- Legislative and Regulatory - Endangered Species Act and Mosquito Control Product Use Requirements: Know the Process Symposium I
Crystal 1
- Mosquito Lightning Symposium
Carson 1
- Social Media and Mosquito Control Symposium
Carson 3
- Special District: Perspectives of Trustees and Commissioners Symposium I
Carson 4
- Student Competition I
Crystal 3

3:15 pm – 4:00 pm

Refreshment Break/Ice Cream Social

Summit Pavilion

(Badge Required)

4:00 pm – 5:30 pm

Afternoon Sessions *(continued)*

- Legislative and Regulatory - Endangered Species Act and Mosquito Control Product Use Requirements: Know the Process Symposium II
Crystal 1

Continued next page

5:45 pm – 7:15 pm

- Factors Allowing for the Transmission of Vector-Borne Viruses: Vector Competence, Vertebrate Host Competence, and Environmental Factors Symposium
Carson 1
 - Latin American Student Competition
Carson 3
 - Special District: Perspectives of Trustees and Commissioners Symposium II
Carson 4
 - Student Competition II
Crystal 3
- Latin American Discussion**
Carson 3

TUESDAY, FEBRUARY 28, 2023

6:30 AM - 7:45 AM Welcome Networking Breakfast

Tahoe

8:00 AM - 12:00 PM*

Plenary Session

**unless otherwise noted*

Moderator: Rui-de Xue

Meeting Room: Reno

- 8:00 Call to Order
Dennis Walette
- 8:05 Welcome to Reno
Claus Tittiger
- 8:10 Program Announcements, Presidential Address
Dennis Walette
- 8:35 Award Presentations
Dennis Walette
- 9:05 AMCA Memorial Lecture - Honoree: Daniel Strickman
Mustapha Debboun
- 10:30 AMCA Training Manuals Update
Jennifer Gordon
- 10:40 Washington D.C. Legislation
Angela Beehler
- 10:55 Public Education, Social Media and Public Relations
Daniel Markowski
- 11:10 A national public health strategy to reduce the burden of vector-borne diseases in the United State: current actions and future plans
Lyle Peterson

10:00 AM - 10:30 AM

Break in Exhibit Hall

Summit Pavilion

Sponsored By Azelis A&ES

12:00 PM - 1:45 PM

Lunch and Exhibits Open

Summit Pavilion

Sponsored By Azelis A&ES & S.C. Johnson

TUESDAY

1:45 PM - 3:15 PM*

Afternoon Sessions

**unless otherwise noted*

Legislative and Regulatory – Endangered Species Act and Mosquito Control Product Use Requirements: Know the Process Symposium I

Moderator: Angela Beehler

1:45 PM – 3:15 PM

Meeting Room: Crystal 1

- 1:45 21 Mosquito control and the Endangered Species Act: a National Marine Fisheries Service overview of addressing risks to aquatic species
David Baldwin, Tony Hawkes, Ryan DeWitt
- 2:05 22 Environmental Protection Agency update on pesticide use limitation areas
Susan Jennings
- 2:25 23 Pesticide Mitigations to Address Endangered Species Concerns
Ashlea Frank
- 2:45 24 Bulletins Live! Two: What increased EPA requirements might mean for your district.
Edward Foley
- 3:00 25 Navigating a local US Fish and Wildlife Service consultation to comply with product labels
Mark Clifton

Mosquito Lightning Symposium

Moderator: Ary Faraji

1:45 PM - 3:15 PM

Meeting Room: Carson 1

- 1:45 1 Making Mosquitoes Disappear on David Copperfield’s Private Island in the Bahamas
Ary Faraji
- 1:45 2 Public Reaction to Social Media Alerts of Increasing WNV Activity
Dennis Walette
- 1:45 3 Aedes papago of the Sonoran Desert
Lawrence Reeves
- 1:45 4 Get ready for the BacDrop: A Cloudbased Larvicide Droplet Analysis Program for Wide Area Larvicide Applications
Katie Williams
- 1:45 5 Exposure of Culex quinquefasciatus to abdominal sublethal adulticide disrupts oviposition behavior
Robert Aldridge, Kenneth Linthicum
- 1:45 6 Get a little mushy
Christopher Bibbs
- 1:45 7 Inside the Tiny and Fascinating World of Mosquito Sperm
Laura Harrington

TUESDAY

- 1:45 8 Is it dominant? Is it recessive? Does it matter?
Tara Thiemann
- 1:45 9 Journal Formatting: To Compromise or Not to Compromise
Steve Peper
- 1:45 10 Novel Electrophysiological Methods for Observing Insecticide and Repellent Action in Mosquitoes
Edmund Norris
- 1:45 11 The future of mosquito control: Oxitec self-limiting gene technology to control *Aedes aegypti*
Rajeev Vaidyanathan
- 1:45 12 Three Influential Papers
Lawrence Hribar
- 1:45 13 Use of a pyriproxyfen-based larvicide in Chicago area catch basins
Justin Harbison
- 1:45 14 We put a jar on a stick and the internet went wild
Sarah Fink, Zach Holbert-Watson
- 1:45 15 We Spray, What Sticks?
Andrew Rivera, Tommy Pemrick
- 1:45 16 Lightning talk: Continent-wide patterns of mosquito diversity.
Michael Reiskind
- 1:45 17 Mmm, mmm good! *Culex* soup in the Chicago area
Mark Clifton
- 1:45 18 Tires as Winter Dens for Tiger Mosquitoes
Lyric Bartholomay, Katie Susong, Bradley Tucker
- 1:45 19 Of Mosquito Romance and Violins
Michael Weber, Tim Ziemer
- 1:45 20 Children of the Corn: Using Drones to Combat the Demons
Piper Kimball, Bill Reynolds, Crystal Grippin, Mir Bear-Johnson, Hector Cardenas

Social Media and Mosquito Control Symposium

Moderator: Michael Mut

1:45 PM - 3:15 PM

Meeting Room: Carson 3

- 1:45 26 Searching social media posts in the "Sunshine"
Robin King
- 2:00 27 Amplifying Your Voice on Social Media: Ideas from the Private Sector
Jeremy Hogan
- 2:15 28 What's Trending in Texas?
Jason Fritz
- 2:30 29 How to Leverage Agency Relations to Expand Social Media Reach and Engagement
Mary-Joy Coburn

TUESDAY, FEBRUARY 28, 2023

- 2:45 30 Increase Your Instagram Engagement 15 Seconds at a Time
Pablo Cabrera
- 2:55 31 Undoing the Creation of Doubt and Undermining on Social Media
Jillian Meek
- 3:05 32 Twitter: the ins and outs of using the microblogging site to Tweet about mosquito control
Michael Mut

Special District: Perspectives of Trustees and Commissioners Symposium I

Moderator: Tianyun Su

1:45 PM - 3:15 PM

Meeting Room: Carson 4

- 1:45 33 Ballot Measures and Funding for Special District to Face Financial Challenges and Service Needs
John Bliss
- 2:00 34 Director/Manager Contract and Performance Evaluation
Brian Tisdale
- 2:15 35 Duties and Responsibilities of Manager or Director
John Smith
- 2:30 36 Budgeting and financial management of a special district
Gary Goodman
- 2:45 37 State Sunshine Law and Its Implication to Florida Districts.
Trish Becker
- 3:00 38 District Governing Bodies in the United States – A Peek Behind the Curtain
Dennis Walette

Student Competition I

Moderator: Casey Parker Crockett

1:45 PM - 3:15 PM

Meeting Room: Crystal 3

- 1:45 39 Chemical Constituents and Larvicidal efficacy of seven Medicinal plant Leaf Extracts against Dengue Vector *Aedes aegypti* L (Diptera : Culicidae)
Shah Fahad
- 1:55 40 Time course analysis of pyrethroid genetic response in *Aedes aegypti* from California.
Lindsey Mack, Geoffrey Attardo
- 2:05 41 Fine-scale associations between land cover and the community composition of *Aedes* (Diptera: Culicidae) mosquitoes
Corey Day, Rebecca Trout Fryxell
- 2:15 42 Bunyavirus Detection in Invasive *Aedes* Mosquito Species from Air Force Installations, 2018 - 2020
Joshua Lassen, Leah Colton
- 2:25 43 Evaluating vector mosquito occurrence in residential rain barrels in Champaign County, IL
Rebecca Cloud, Andrew Mackay, Catherine Wangen, Brian Allan

- 2:35 44 Microplastic ingestion alters the composition of *Aedes* mosquito species microbiota.
Carla-Cristina Edwards, Gabriella McConnel, Corey Brelsfoard, Jaclyn Canas-Carrell
- 2:45 45 Expanded phylogeographic analysis of the Asian longhorned tick (*Haemaphysalis longicornis*) using mitogenomics
Zoe Narvaez, Andrea Egizi, Dana Price
- 2:55 46 Assessing permethrin resistance for *Culex tarsalis* in Southern California
Julie Tsecouras, Tara Thiemann, Kim Hung, Jennifer Henke, Alec Gerry

3:15 PM - 4:00 PM

Break in Exhibit Hall

Summit Pavilion

3:15 PM - 4:00 PM

Ice Cream Social

Summit Pavilion

Sponsored By: Valent BioSciences

4:00 PM - 5:30 PM*

Afternoon Sessions (Cont.)

**unless otherwise noted*

Factors Allowing for the Transmission of Vector-Borne Viruses: Vector Competence, Vertebrate Host Competence, and Environmental Factors Symposium

Moderator: Michael J. Turell

4:00 PM - 5:30 PM

Meeting Room: Carson 1

- 4:06 47 What makes a particular species of mosquito a competent vector?
Rebekah Kading
- 4:20 48 Lethal and sublethal effects of insecticides: Within species variability of mosquito vector competence
Barry Alto, Abdullah Alomar, Kauara Campos
- 4:34 49 What makes a particular vertebrate an important amplifying host?
Jefferson Vaughan
- 4:48 50 How the presence of other organisms in a viremic vertebrate host may affect the ability of a mosquito feeding on that host to be able to transmit that virus.
Michael Turell
- 5:02 51 Unraveling the complex influence of environmental temperature on vectorial capacity of mosquitoes for arboviruses
Alexander Ciota
- 5:16 52 The effect of rainfall on the ability of mosquitoes to transmit a virus or parasite and disease occurrence
Kenneth Linthicum, Assaf Anyamba, Seth Gibson

Latin American Student Competition

Moderator: Catalina Alfonso-Parra

4:00 PM - 5:30 PM

Meeting Room: Carson 3

- 4:00 53 Polymorphisms in the vgsc of *Aedes aegypti* and *Aedes albopictus* from Mexico
Perla Cecilia Martínez, Mitzi Garcia-Bernal, Beatriz Lopez-Monroy, Andre Castro-Bautista, Gustavo Ponce-Garcia, Adriana E. Flores-Suarez
- 4:10 54 Polymorphisms in voltage gated sodium channel (vgsc) gene and its association with resistance to pyrethroid insecticides in *Aedes aegypti* (L.) (Diptera: Culicidae) populations from Mexico
Andre Castro-Bautista, Perla Cecilia Martínez, Beatriz Lopez-Monroy, Gustavo Ponce-Garcia, Jesus A. Davila-Barboza, Ildefonso Fernández-Salas, Adriana E. Flores-Suarez
- 4:20 55 *Aedes aegypti* control using synthetic double-stranded RNA
Mariana Lizbeth Jiménez-Martínez, María de Lourdes Ramírez-Ahuja, Gerardo de Jesús Trujillo-Rodríguez, Iram Pablo Rodríguez-Sanchez
- 4:30 56 Comparison of *Aedes aegypti* populations resistant to pyrethroid insecticides against those formulated in vitro
Gerardo de Jesús Trujillo-Rodríguez, María de Lourdes Ramírez-Ahuja, Mariana Lizbeth Jiménez-Martínez, Iram Pablo Rodríguez-Sanchez
- 4:40 57 Population biocontrol of *Aedes aegypti* with simple synthetic RNA.
María de Lourdes Ramírez-Ahuja, Gerardo de Jesús Trujillo-Rodríguez, Mariana Lizbeth Jiménez-Martínez, Iram Pablo Rodríguez-Sanchez

Legislative and Regulatory - Endangered Species Act and Mosquito Control Product Use Requirements: Know the Process Symposium II

Moderator: Angela Beehler

4:00 PM - 5:30 PM

Meeting Room: Crystal 1

- 4:00 58 Endangered Species and Registration Review for Mosquitocides
Paul Whatling
- 4:25 59 Process of Making Refinements to the Models used by the Environmental Protection Agency when Public Health Pesticides are Registered for Area Wide Ultra Low Volume Adult Mosquito Control
David Brown
- 4:40 60 The Impact of New Pesticide Regulations to Protect Endangered Species
Daniel Markowski
- 4:55 61 RESPECT Plan- Report of Endangered Species and Pollinator Evaluation of Chemical Treatment-A decision making template for non-target assessment in mosquito management
Dan Killingsworth

- 5:15 62 AMCA legislative and regulatory issues and meeting update
Angela Beehler

Special District: Perspectives of Trustees and Commissioners Symposium II

Moderator: Tianyun Su

4:00 PM - 5:30 PM

Meeting Room: Carson 4

- 4:00 63 Of Transparency, Contracts and Performance: Navigating the Brown Act, Director Contracts & Performance Evaluations for Mosquito Abatement Districts in California.
William A. Donahue
- 4:15 64 Special District's Challenges for New Managers/Directors – Expect the Unexpected
J. Wakoli Wekesa
- 4:30 65 Strategic Planning in District Operations
Jeremy Wittie
- 4:45 66 Doubling the District's size: Two years of outreach, politicking, and patience
Robin King
- 4:55 67 Pesticide Product Performance Data Requirements for Products Claiming Efficacy Against Certain Invertebrate Pests
Elizabeth Andrews
- 5:05 68 The Grounding of Unmanned Aerial Systems (UAS) in Florida: will the Lee County Mosquito Control District Fly UAS in 2023?
Aaron Lloyd, David Hoel, Eric Jackson
- 5:15 69 Barrier treatments methods for residential mosquito management revisited- the backpack fogger is obsolete
Daniel Killingsworth

Student Competition II

Moderator: Casey Parker Crockett

4:00 PM - 5:30 PM

Meeting Room: Crystal 3

- 4:00 70 Effects of Wolbachia and larval competition on fitness and West Nile virus infection in *Culex quinquefasciatus*
Abdullah Alomar, Eric Caragata, Barry Alto
- 4:10 71 Implications of pre-diapause timing on *Culex pipiens* energetic reserve acquisition and overwintering success
Sara Wilson
- 4:20 72 Thermal preferences of *Aedes aegypti* mosquitoes
Olivia Winokur, Christopher Barker, Claire Chapman
- 4:30 73 Evaluation of silver nanoparticles as a control tool against adult mosquito vectors
Kai Blore, Rebecca Baldwin, Christopher Batich, Philip Koehler, Roberto Pereira, Cameron Jack, Whitney Qualls, Rudy Xue
- 4:40 74 Host associations of biting midges (Diptera: Ceratopogonidae: Culicoides) at deer farms in Florida, USA.
Kristin Sloyer, Carolina Acevedo, Samantha Wisely, Nathan Burkett-Cadena

- 4:50 75 Inhibition of the pentose phosphate pathway to interfere with metabolic mechanisms of insecticide resistance: Evaluation of a potential pyrethroid synergist
Erin Kelly, Geoffrey Attardo
- 5:00 327 Evaluating Metabolic Resistance in *Culex quinquefasciatus* Across the State of Florida
TJ Fedirko, Eva Buckner PhD, Alden Estep

5:45 PM - 7:15 PM

Latin American Discussion

Carson 3

TUESDAY



89TH ANNUAL MEETING
At-A-Glance

Wednesday, March 1, 2023

7:30 am – 5:30 pm

Registration

Grand Salon

7:30 am – 5:30 pm

Speaker Ready Room

Grand Salon

8:00 am – 2:00 pm

Education Day

Off-site Event

8:00 am – 12:30 pm

Trustee/Commissioner Tour

Off-site Event (Badge Required)

8:30 am – 10:00 am

Morning Sessions

- Insecticide Resistance - Building a Program Step by Step Symposium I
Crystal 1
- National perspective into treatment thresholds for mosquito management Symposium I
Crystal 3
- Next-Generation Genetic and Biological Approaches to Aedes Control: SIT and Beyond Symposium I
Carson 1
- Novel Adulticide Space Spray: A Decade of Innovation Symposium I
Carson 4
- Remembering William (Bill) E. Walton - aquatic ecologist, vector ecologist, leader, colleague, and friend Symposium I
Carson 3

10:00 am – 10:45 am

Refreshment Break

Summit Pavilion

10:45 am – 12:15 pm

Morning Sessions (continued)

- Insecticide Resistance - Building a Program Step by Step Symposium II
Crystal 1
- National perspective into treatment thresholds for mosquito management Symposium II
Crystal 3
- Next-Generation Genetic and Biological Approaches to Aedes Control: SIT and Beyond Symposium II
Carson 1
- Novel Adulticide Space Spray: A Decade of Innovation Symposium II
Carson 4

Continued next page

12:15 pm – 1:45 pm

- Remembering William (Bill) E. Walton - aquatic ecologist, vector ecologist, leader, colleague, and friend Symposium II
Carson 3

Poster Session

Summit Pavilion

2:15 pm – 4:00 pm

Exhibits Open

Lunch Available

Summit Pavilion

12:30 pm – 1:30 pm

Trustee Luncheon

Summit Pavilion

1:45 pm – 3:15 pm

Afternoon Sessions

- Using NASA Satellite Data to Complement Vector Control Practices Symposium
Crystal 1
- West Nile virus and other arthropod-borne pathogens in Arizona: Surveillance and mitigation strategies Symposium I
Crystal 3
- Resist the urge to panic: Managing resistance in field operations Symposium I
Carson 1
- Young Professional Symposium I
Carson 4
- Overview of Applied Research Programs at the District/Program Level Symposium I
Carson 3

3:15 pm – 4:00 pm

Refreshment Break/Donut Social

Summit Pavilion

4:00 pm – 5:00 pm

Exhibitor Reception

Summit Pavilion (Invitation Only Event)

4:00 pm – 5:30 pm

Afternoon Sessions *(continued)*

- Spatial Repellents Symposium
Crystal 1
- West Nile virus and other arthropod-borne pathogens in Arizona: Surveillance and mitigation strategies Symposium II
Crystal 3
- Resist the urge to panic: Managing resistance in field operations Symposium II
Carson 1
- Young Professional Symposium II
Carson 4
- Overview of Applied Research Programs at the District/Program Level Symposium II
Carson 3

5:30 pm – 6:30 pm

Young Professionals Social

Sierra 1 (Invitation Only Event)

6:30 pm – 7:30 pm

Past Presidents Reception

Hotel Suite (Invitation Only Event)

8:00 AM - 2:00 PM

Trustee/Commissioner Tour

8:00 AM - 3:00 PM

Education Day

8:30 AM - 10:00 AM*

Morning Sessions

**unless otherwise noted*

Insecticide Resistance - Building a Program Step by Step Symposium I

Moderator: Roxanne Connelly, Janet McAllister

8:30 AM - 10:00 AM

Meeting Room: Crystal 1

8:35 76 Lessons Learned While Setting Up a Mosquito Resistance Laboratory in a Public Health Department, Phase I

Nina Dacko

8:55 77 Collaboration Combats Insecticide Resistance and Improves Vector Management

Casey Parker Crockett, Katie Williams, Tre Williams, Alden Estep, Caio Martinelle Franca

9:15 78 Hooah! Standing Up an Insecticide Resistance Testing Program for CONUS Army Installations

Jennifer Carder

9:35 79 Bioassays and biochemical testing, a comprehensive IR approach

Constance Darrisaw, Kara Tyler-Julian, David Hoel, Aaron Lloyd

National perspective into treatment thresholds for mosquito management Symposium I

Moderator: Whitney Qualls

8:30 AM - 10:00 AM

Meeting Room: Crystal 3

8:30 80 Review of Action Thresholds from the Literature

Whitney Qualls, Vindhya Aryaprema

8:45 81 The utility of environmental models to help inform entomological thresholds

Lindsay Campbell

9:05 82 Using entomological and environmental indicators to better understand mosquito disease risk

Mohamed Sallam

9:25 83 Temperature dynamic West Nile virus vector thresholds, St. Tammany Parish, Louisiana.

Kevin Caillouet, Nicholas DeLisi, Josh Foulon, Calvin Smotherman

9:45 84 Developing and Implementing a West Nile Virus Driven Response Grid System Using Arcgis Hot-Spot Analysis In Orange County, CA

Kiet Nguyen, Timothy Morgan, Laura Krueger, Sokanary Sun, Xiaoming Wang, Robert Cummings, Amber Semrow

WEDNESDAY

Next-Generation Genetic and Biological Approaches to Aedes Control: SIT and Beyond Symposium I

Moderator: Rajeev Vaidyanathan, David F. Hoel

8:30 AM - 10:00 AM

Meeting Room: Carson 1

- 8:30 85 Development of SIT as an IPM tool for the Control of *Aedes aegypti*
Kenneth Linthicum, Robert Aldridge, Barbara Bayer, Seth Gibson, Rudy Xue, Whitney Qualls, Chao Chen, Daniel Hahn
- 8:45 86 Startup costs associated with an X-ray SIT program at Lee County Mosquito Control District
David Hoel, Rachel Morreale, Aaron Lloyd
- 9:00 87 Progress and challenges for the *Aedes aegypti* (L.) sterile insect technique program on Captiva Island (Lee County, Florida)
Steven Stenhouse, Rachel Morreale, Johanna Bajonero, Danilo de Oliveira Carvalho, Aaron Lloyd, David Hoel
- 9:10 88 Evaluation of X-ray radiation to adult male *Aedes aegypti* – Gainesville, FL strain
Barbara Bayer, Robert Aldridge, Jediah Kline, Bianca Moreno, Seth Gibson, Chao Chen, Peter Jiang, Daniel Hahn, Kenneth Linthicum
- 9:20 89 Southern California SIT Joint Pilot Project: Partnering for The Future of Mosquito Control
Steven Vetrone, Amber Semrow, Tanya Posey, Timothy Morgan, Nicolas Tremblay, Sokanary Sun, Steve Shepherd, Rick Howard, Susanne Klüh
- 9:30 90 Confronting SIT misinformation in Berkeley, California
Judith Pierce, Eric Haas Stapleton, Ryan Clausnitzer, Robert Beatty
- 9:45 91 Collaborative efforts between Delta Mosquito & Vector Control District and Oxitec in the Central Valley of California
Mustapha Debboun

Novel Adulticide Space Spray: A Decade of Innovation Symposium I

Moderator: Beth Ranson

8:30 AM - 10:00 AM

Meeting Room: Carson 4

- 8:30 92 Introduction and Overview of ReMoa Tri™
Beth Ranson, Chris Byrne
- 8:40 93 Transient tolerance to pyrethroids in gravid mosquitoes: Implications for viral transmission and ULV control
Mark Clifton

WEDNESDAY, FEBRUARY 28, 2023

- 8:55 94 Evaluation of VBC-60748 against pyrethroid-resistant *Aedes aegypti* and *Culex quinquefasciatus* in Collier County, Florida
Rebecca Heinig, Rachel Bales, Robert Straser, Atom Rosales, Zachary Nickell, Keira Lucas
- 9:10 95 Data Collection and Considerations in the Drift of a Novel Formulation
Harold Thistle, Leanne Lake, Banugopan Kesavaraju
- 9:25 96 The history of development of ReMoa Tri™; Concept to Reality
Benjamin Belkind, Banugopan Kesavaraju
- 9:40 97 Pilot study with ReMoa™, a new mosquito adulticide, dispersed by thermal fogging against susceptible and pyrethroid resistant *Aedes aegypti* populations
Seleena Benjamin, Guat Ney Teoh, Nazni Wasi Ahmad

Remembering William (Bill) E. Walton - aquatic ecologist, vector ecologist, leader, colleague, and friend Symposium I

Moderator: Jennifer A. Henke

8:30 AM - 10:00 AM

Meeting Room: Carson 3

- 8:35 98 Bill Walton – Dedicated leadership and teaching innovation
Alec Gerry
- 8:50 99 Wetlands, climate, and mosquitoes
Dave Heft
- 9:00 100 Elemental Stoichiometry of Larval *Culex* Mosquitoes and the Effect of mosquitofish on the community dynamics of a constructed treatment wetland in Hemet CA
George Peck
- 9:15 101 Following My Passions, a tribute to the teachings and lessons of Dr. Bill Walton
Adena Why
- 9:30 102 A Culture of Collaboration in Public Health Entomology
Aviva Goldmann
- 9:45 103 Underground Mosquito Control Strategies: Entomopathogenic Fungi and Attractive Toxic Sugar Bait in the Storm Drainage System of the Coachella Valley
David Popko

10:00 AM - 10:45 AM

Break in Exhibit Hall

Summit Pavilion

Sponsored By Valent BioSciences

10:45 AM - 12:15 PM*

Morning Sessions (Cont.)

**unless otherwise noted*

Insecticide Resistance - Building a Program Step by Step Symposium II

Moderator: Roxanne Connelly, Janet McAllister

10:45 AM - 12:15 PM

Meeting Room: Crystal 1

10:45 104 A Comparison of the Topical Application Assay and the CDC Bottle Bioassay Kit in *Culex quinquefasciatus* Mosquitoes from New Orleans, Louisiana.

Erin Cloherty Duvernay, James Ottea, Kristen Healy, Claudia Riegel, Janet McAllister, Mark Janowiecki

11:05 105 Statewide testing of *Culex quinquefasciatus* from Florida

Eva Buckner

11:25 106 The Big Picture – impact of IR testing on WNV Control decisions

Justin Harbison, Mark Clifton

11:45 000 Panel Discussion - Insecticide Resistance - Building a Program Step by Step

National perspective into treatment thresholds for mosquito management Symposium II

Moderator: Whitney Qualls

10:45 AM - 12:15 PM

Meeting Room: Crystal 3

10:45 108 Development of WNV Area-Wide Control Triggers For Grided Surveillance System in Orange County, CA

Timothy Morgan, Kiet Nguyen, Laura Krueger, Sokanary Sun, Xiaoming Wang, Robert Cummings, Amber Semrow

11:00 109 Development of Adult Control Activation Thresholds at the Toledo Area Sanitary District

Jennifer Shimola

11:15 110 Implementation of Activation Thresholds at the Toledo Area Sanitary District

Jacob Sublett

11:30 111 Setting action thresholds for larvicide and adulticide applications throughout the Florida Keys

Andrea Leal, Mikki Coss

11:45 112 Ready, Set, Action Thresholds in Williamson County, Texas

Jason Fritz

Next-Generation Genetic and Biological Approaches to Aedes Control: SIT and Beyond Symposium II

Moderator: Rajeev Vaidyanathan, David F. Hoel

10:45 AM - 12:15 PM

Meeting Room: Carson 1

- 10:45 113 Reinfestation of *Aedes aegypti* following the Debug Fresno program
Jodi Holeman
- 11:00 114 *Wolbachia* infected males for suppressing populations of *Aedes aegypti* and *Aedes albopictus*
Stephen Dobson
- 11:15 115 Infection by wMel *Wolbachia* alters female post-mating behaviors and physiology in the dengue vector mosquito *Aedes aegypti*
Catalina Alfonso-Parra, Jessica Osorio, Sara Villa-Arias, Carolina camargo, Luisa M Barrientos, Luis Felipe Ramírez-Sánchez, Stephen Dorus, Frank W. Avila
- 11:25 116 The design of an industrial production line aiming for cost reduction of sterile mosquitos on large scale operations
Hanan Lepek
- 11:35 117 DO. OR DO NOT. THERE IS NO “TRY” (YODA).
Nitzan Paldi
- 11:50 118 Practical field application of Oxitec self-limiting gene technology against *Aedes aegypti*
Rajeev Vaidyanathan

Novel Adulticide Space Spray: A Decade of Innovation Symposium II

Moderator: Beth Ranson

10:45 AM - 12:15 PM

Meeting Room: Carson 4

- 10:45 119 Efficacy of ReMoa Tri against resistant malaria vectors in Africa, *Anopheles gambiae* ss and *An. arabiensis*
Dismas Kamande, Silas Majambere, Sarah Moore, Jason Moore, Banugopan Kesavaraju
- 11:00 120 ADrop™ – Droplet analysis tool for analyzing fluorescent adulticide droplets using open source software
Banugopan Kesavaraju, Katie Williams, Leanne Lake
- 11:15 121 Understanding Metabolic and Knockdown Resistance and Their Impact
Chris Byrne, Beth Ranson
- 11:30 122 “Conducting Aerial Adulticide Efficacy Trials”
Leanne Lake
- 11:45 123 ReMoaTri Technical Tips
Katie Williams, Leanne Lake, Banugopan Kesavaraju

Remembering William (Bill) E. Walton - aquatic ecologist, vector ecologist, leader, colleague, and friend Symposium II

Moderator: Jennifer A. Henke

10:45 AM - 12:15 PM

Meeting Room: Carson 3

10:45 124 The Maestro of Midgeville: how one man and one plot brought field research to the doorstep of generations of students

Benjamin Nyman

11:00 125 Science Communication: Bill as a Leader in Teaching

Jennifer A. Henke, Julie Tsecouras

11:15 126 Leaving a legacy: creating opportunities for the next generation of vector ecologists

Christopher Barker

12:15 PM - 1:45 PM

Lunch

Summit Pavilion

12:15 PM - 1:45 PM*

Afternoon Sessions

**unless otherwise noted*

Poster Session

12:15 PM - 1:45 PM

Meeting Room: Summit Pavilion

12:15 P1 Sterile Insect Technique (SIT) for Individual Property Owners: A Review of the MosquitoMate Experience

Karen Dobson

12:15 P2 Biodegradable Vector Control System

Thomas Kollars, Kathryn Kollars, Lee McPhatter, Mark Carder

12:15 P3 Entomological, epidemiological, and climatological investigation of the 2019 Dengue Fever outbreak in Gewane District, Afar Region, North-East Ethiopia

Louisa Messenger, Wondemeneh Mekuriaw, Solomon Kinde, Bezabih Kindu, Yibeyin Mulualem, Girma Hailu, Araya Gebresilassie, Chalachw Sisay, Fitsum Bekele, Hiwot Amare, Mesfin Wossen, Adugna Woyessa, Chad Cross

12:15 P4 IPM Working Group: Mosquito BEACONS - Biodiversity Enhancement And Control of Non-native Species

Michael Riles, Dan Killingsworth, Valerie Nguyen, Ana Romero-Weaver, Yasmin Tavares, Amely Bauer, Bryan Giordano, Benjamin Allen, Elmer Gray, Lindsay Campbell, Yoosook Lee

12:15 P5 Are there good mosquitoes? A preliminary exploration of mosquito pollination

Christopher Vitek, Ashley Guerrero, Satinderpal Kaur, Rupesh Kariyat, Julie Mustard

WEDNESDAY, FEBRUARY 28, 2023

- 12:15 P6 Puerto Rico Vector Control Unit's Large and Growing Integrated Vector Control Program
Nexilianne Borrero, Grayson Brown, Julieanne Miranda-Bermúdez, Joanelis Medina, Cristhian Sánchez-Rolón
- 12:15 P7 Population structure of the mosquito *Aedes aegypti* in Saudi Arabia
Abadi Mashlawi
- 12:15 P8 Surveillance of *Aedes* mosquitoes in District Poonch, Azad Jammu and Kashmir
Junaid Rahim
- 12:15 P9 Lyme Disease Vector Geographic Range Expansion: South Carolina is a Battleground of Northern and Southern *Ixodes scapularis* clade colonization into new ecosystems
Anna Dill, Melissa Nolan, Kyndall Braumuller, Kia Zellars
- 12:15 P11 Community College and Local Agency Cooperation to Evaluate Mosquito Populations and Increase Undergraduate Research
Marcus Baber-Newton, Dustan Francis, Teresa Gaus-Bowling, Crystal Moss, Jacob Price
- 12:15 P12 Effect of Mosquito Age and Specimen Storage Duration on *Aedes aegypti* RNA-based Assays
Nicole Foley, Anna Drexler, Linda Kothera, Saul Lozano
- 12:15 P13 Taking Flight; Utilizing Unmanned Aircraft Systems in Delta Mosquito and Vector Control District
Hector Cardenas, Mustapha Debboun
- 12:15 P14 Finding the Right Mix: A Comparison of Yeast Fermentation Solutions as an Alternative Carbon Dioxide Source for BG-Sentinel Traps
Mark Nakata, Andrea Troupin, Crystal Grippin, Javier Valdivias, Mustapha Debboun
- 12:15 P15 A Valiant Attempt at Surveying Mosquito District Practices of California
Andrea Troupin, Crystal Grippin, Mark Nakata, Javier Valdivias, Mustapha Debboun
- 12:15 P16 Evaluation of *Aedes* larvae Habitat Characteristics in South Punjab Pakistan
Shafia Saba, Unsar Naeem-Ullah, Shafqat Saeed, Ishtiaq Rajwana, Ata-ur-Rehman Khan, Dil awez
- 12:15 P17 The Effects of a Sublethal Dose of an Insecticide on Mosquito Predators
Erin Cloherty Duvernay, James Ottea
- 12:15 P18 The socio-cognitive field of the sterile insect technique (1979-2022): Insights into its specific labor division form and some other aspects
Kamil Ghouati
- 12:15 P20 Quality Control Methods implemented in the Integrated Vector Management (IVM) at Puerto Rico Vector Control Unit
Cristhian Sánchez-Rolón, Grayson Brown, Nexilianne Borrero, Julieanne Miranda-Bermúdez

WEDNESDAY, FEBRUARY 28, 2023

- 12:15 P21 What we know about mosquito control and fireflies
Kristen Healy, Daniel McNamara
- 12:15 P22 Knockdown resistance mutations in California: monitoring insecticide resistance in *Culex tarsalis*
Esther Cutshall, Eric Moyung, Tara Thiemann
- 12:15 P23 Establishing the Window of Selection (WoS) and the level of resistance of knock down resistant (kdr) mutations for *Aedes aegypti* mosquitoes topically treated with deltamethrin
Brook Jensen, Alden Estep, Emma Royster, Silvie Huijben
- 12:15 P24 The status of La Crosse virus in La Crosse, Wisconsin
Drew Lysaker, Barrett Klein, Bradley Tucker, Lyric Bartholomay
- 12:15 P25 ARGO trailer nurse tank for extended larvicide applications at remote sites
Mark Wieland
- 12:15 P26 Experimental transmission of Mayaro virus by *Aedes aegypti* mosquitoes
Abdullah Alomar, Barry Alto
- 12:15 P19 Building an IIT/SIT program at Anastasia Mosquito Control District
Whitney Qualls, Rudy Xue

12:15 PM - 4:00 PM

Exhibits Open

Summit Pavilion

1:45 PM - 3:15 PM*

Afternoon Sessions (Cont.)

**unless otherwise noted*

Overview of Applied Research Programs at the District/Program Level Symposium I

Moderator: Whitney Qualls

1:45 PM - 3:15 PM

Meeting Room: Carson 3

- 1:45 127 Assessing past and present applied research projects conducted in Manatee County, Florida
Samantha Ramirez, Mark Latham, Jacob Hart, Christopher Lesser
- 2:05 129 Field trials and resistance testing in Maricopa County
James Will, John Townsend
- 2:25 130 What exactly do you do during the winter months as a northern MAD?
Patrick Irwin

Resist the urge to panic: Managing resistance in field operations Symposium I

Moderator: Isik Unlu

1:45 PM - 3:15 PM

Meeting Room: Carson 1

- 1:45 131 The Integrated Vector Management approach to effective resistance management
Alden Estep, Neil Sanscrainte
- 1:55 132 Outbreak! When you're under a microscope without insecticide resistance data
Janet McAllister, Cassie Scott, Roxanne Connelly
- 2:15 133 Mechanism matters: Efficacy of commercial formulations and the relationship to underlying insecticide resistance mechanisms
Neil Sanscrainte, Alden Estep
- 2:25 134 Linking resistance monitoring data to control: a framework for addressing critical knowledge gaps
Laura Harrington, Lindsay Baxter
- 2:45 135 NEVBD's pesticide resistance program: a collaborative system for monitoring, assay development and education.
Lindsay Baxter
- 3:00 136 Crouching Tiger, Obvious Trouble: Resistance Management in Miami-Dade County
Isik Unlu, Eva Buckner

Using NASA Satellite Data to Complement Vector Control Practices Symposium

Moderator: Helena Chapman

1:45 PM - 3:15 PM

Meeting Room: Crystal 1

- 1:45 137 Improving Vector Control with NASA Data: An Overview of NASA Health and Air Quality Applications
John Haynes
- 2:00 138 Blending Multi-source Data Sets to Forecast Vector-borne Disease Risk
Assaf Anyamba
- 2:15 139 Making sense of disparate data types using VectorSurv
Christopher Barker, Tim Valdepena, Jody Simpson, Shawn Ranck, Kurt Johnson, Lincoln Wells, Christina De Cesaris
- 2:30 140 Mosquito control alchemy: turning data into effective control strategies
Sarah Wheeler
- 2:45 141 Use of geo-spatial data to plan and monitor dengue vector control
Roberto Barrera
- 3:00 142 Panel Discussion - Using NASA Satellite Data to Complement Vector Control Practices

West Nile virus and other arthropod-borne pathogens in Arizona: Surveillance and mitigation strategies Symposium I

Moderator: Crystal Hepp

1:45 PM - 3:15 PM

Meeting Room: Crystal 3

1:45 143 Preventing the spread of Rocky Mountain Spotted Fever (RMSF) in Arizona

John VandenBrooks

2:15 144 Ceratopogonid midges as potential vectors of *Onchocerca lupi* in Northern Arizona

Chandler Roe, Kelly Upshaw-Bia, Olivia Holiday, Jennifer Urbanz, Guilherme Verocai, Chase Ridenour, Morgan Ford, Theodore Kennedy, Crystal Hepp, Jason Sahl

2:45 145 Evolutionary ecology of *kdr* resistance mutations in *Aedes aegypti* mosquitoes

Silvie Huijben, Brook Jensen, Rachel Althoff, Joshua Kalmouni, Joshua Ain, Chance Spurlin, Krijn Paaijmans, Alden Estep

Young Professional Symposium I

Moderators: Sarah Lawton, Kyndall Braumuller, Tarolyn Frisbie, Teahna Ratliff, Caroline Gongora, Chloe Wang

1:45 PM - 3:15 PM

Meeting Room: Carson 4

Panel Discussion: “Challenges in Mosquito Control and How to Combat Them”

1:45 Welcome and Introductions

2:00 Panel Discussion and Q&A

Panel Discussion:

Kristen Healy discussing “Pollinators and Mosquito Control: Keeping the Peace”

Michael Riles discussing “Invasive Species & Migration of Mosquitoes”

Becky Trout Fryxell discussing “Getting the Public to Care – What would Happen Without Mosquito Control?”

Alden Estep discussing “Insecticide Resistance: What is Next?”

Nina Dacko discussing “Allocating Funds in a District: How do we Decide What is Worth More or Less?”

3:15 PM - 4:00 PM

Break in Exhibit Hall

Sponsored By FMC

3:15 PM - 4:00 PM

Donut Social

Summit Pavilion

Sponsored By Azelis A&ES

4:00 PM - 5:00 PM

Vendor Meeting & Reception

4:00 PM - 5:30 PM*

Afternoon Sessions (Cont.)

**unless otherwise noted*

Overview of Applied Research Programs at the District/Program Level Symposium II

Moderator: Whitney Qualls

4:00 PM - 5:30 PM

Meeting Room: Carson 3

4:00 146 SLCMAD! Where Research Ideas Connect

Christopher Bibbs, Greg White, Ary Faraji

4:20 147 Designed with the Desert in Mind – A Research Program for Coachella Valley MVCD

Jennifer Henke

4:40 148 An Overview of the Applied Research Program at Anastasia Mosquito Control District

Whitney Qualls

5:00 149 Overview of applied research at the Metropolitan Mosquito Control District

Mark Smith

West Nile virus and other arthropod-borne pathogens in Arizona: Surveillance and mitigation strategies Symposium II

Moderator: Crystal Hepp

4:00 PM - 5:30 PM

Meeting Room: Crystal 3

4:00 150 Detection and characterization of a novel insect-specific flavivirus in a Maricopa County *Aedes aegypti* mosquitoes

Daryn Erickson

4:15 151 Mitochondrial population phylogenomics of the West Nile virus vector *Culex quinquefasciatus* in the southwestern United States

Zachary Barrand

4:30 152 Comparative West Nile virus surveillance and mitigation strategies in Maricopa County

John Townsend

5:00 153 The Persistence of West Nile Virus in the Southwestern United States

Crystal Hepp

Young Professional Symposium II

Moderators: Sarah Lawton, Kyndall Braumuller, Tarolyn Frisbie, Teahna Ratliff, Caroline Gongora, Chloe Wang

4:00 PM - 5:30 PM

Meeting Room: Carson 4

Overview of the Career Roundtables and Introduction of Experts

Kyndall Braumuller, AMCA YP Advisor

Young Professionals will discuss career information and advice with experts representing a variety of career paths.

Academia

Catalina Alfonso-Parra – Universidad de Antioquia

Corey Brelsfoard – Texas Tech University

Consulting/Entrepreneurship

Jennifer Gordon – Bug Lessons Consulting

Edward Horvath – Three Rivers Mosquito Control/Consulting

Federal/State Service

Alden Estep – USDA

Roxanne Connelly – CDC

Industry

Michael Riles – Central Life Sciences

Hanan Lepek – Senecio Robotics

Military

Deanna Scheff – US Air Force

Jennifer Carder – US Army

Mosquito Control

Nicholas DeLisi – St. Tammany Parish Mosquito Abatement

Hector Cardenas – Delta Mosquito and Vector Control District

Public Relations/Education

Cindy Mulla – Beach Mosquito Control District

Heather Hyland – Orange County Mosquito and Vector Control District

Full biographies of our expert participants can be found on the AMCA YP website (amcayps.wordpress.com). In addition, requests for delivery via email may be made by sending an email to AMCAYPs@gmail.com.

- 4:10 Rotation #1
- 4:25 Rotation #2
- 4:40 Rotation #3
- 4:55 Rotation #4
- 5:10 Rotation #5
- 5:25 Group Photo

WEDNESDAY

Resist the urge to panic: Managing resistance in field operations Symposium II

Moderator: Isik Unlu

4:00 PM - 5:35 PM

Meeting Room: Carson 1

- 4:00 154 Resistance breeds creativity: How IR redefined our thresholds, timings, and treatments
Nicholas DeLisi, Lisa Rowley, Kevin Caillouet
- 4:15 155 Country-wide scope of pyrethroid resistance in *Aedes aegypti* in Peru and implications for resistance management
Gissella Vasquez
- 4:35 156 Operational perspectives of mosquito larvicide resistance
Tianyun Su
- 4:50 157 Resistance vs. tolerance: evaluating the potential for larvicide resistance in the northeast US
Joseph McMillan, Michael Olson, John Shepard, Tanya Petruff, Philip Armstrong
- 5:05 158 What leads to pyrethroid resistance in *Culex tarsalis*?
Tara Thiemann, Billy Mortola, Sumiko De La Vega, Bonnie Ryan
- 5:15 159 Monitoring of resistance in *Aedes aegypti* population from different habitats against different insecticides
Shabab Nasir
- 5:25 160 Guidelines for Larvicide Resistance Testing: Applications, Challenges and Modifications
Laxmi Shanmugam

Spatial Repellents Symposium

Moderator: Daniel Kline

4:00 PM - 5:40 PM

Meeting Room: Crystal 1

- 4:00 161 Spatial Repellents: Current Status and Potential Future in Mosquito/vector Population Management Strategies
Daniel Kline
- 4:10 162 The Surprising Intersection of Custom Flight Chambers, Quantitatively Gas Chromatography and Tissue Engineering in Mosquito Research and Spatial Repellents
Bradley Willenberg, Corey Seavey, Mona Doshi, Andrew Panarallo, Angelo Colamarino, Michael Felice, Brian Kim, Andrew Dickerson, Mollie Jewett
- 4:20 163 3D printed transfluthrin based novel spatial repellent devices for enclosed spaces
Nagarajan Ramasamy Rajagopal, Adam Bowman, Christopher Batich, Daniel Kline
- 4:30 164 Evaluating natural product repellency in a small-tube laboratory assay
Edmund Norris, Edmund Norris, Jedidiah Kline

- 4:40 165 Volatile Pyrethroids Against Mosquitoes: A meta-analysis of the association between mosquito exposure to volatile pyrethroid-based spatial repellents and mosquito bite prevention
Ingrid Chen, Sarah Miller, Kyeba Swai, Isabel Elaine Allen, Neil Lobo, Fredros Okumu, Sarah Moore
- 4:50 166 Evaluation Systems for Spatial Repellents against Ticks
Muhammad Farooq, Rudy Xue
- 5:00 167 Efficacy of spatial repellents varies depending on structure of the protected area
Frances Golden, Seth Gibson, Daniel Kline, Robert Aldridge, Barbara Bayer, Adam Bowman, Maurice Solomon, Benjamin McMillan, Kenneth Linthicum, Nagarajan Ramasamy Rajagopal, Christopher Batich, Jeffrey Wahl
- 5:10 168 Current Interest in Non-DEET Insect Repellents, Efficacy, Safety and the “Clean” Movement
Howard Epstein
- 5:20 169 Spatial repellent efficacy in outdoor open enclosures in a north Florida forest
Barbara Bayer, Robert Aldridge, Adam Bowman, Frances Golden, Daniel Kline, Maurice Solomon, Nagarajan Ramasamy Rajagopal, Christopher Batich, Jeffrey Wahl, Jeffrey Bloomquist, Seth Gibson, Kenneth Linthicum
- 5:30 170 Efficacy Of Different Plants Smoke (Emanator) Against Aedes Mosquitoes
Shabab Nasir

5:30 PM - 6:30 PM

Young Professionals Social

(Invitation Only Event)

Sponsored By Valent BioSciences

6:30 PM - 7:30 PM

Past President’s Reception

(Invitation Only Event)



89TH ANNUAL MEETING
At-A-Glance
Thursday, March 2, 2023

- 7:30 am – 3:30 pm** **Registration**
Grand Salon
- 7:30 am – 4:00 pm** **Speaker Ready Room**
Grand Salon
- 8:30 am – 10:45 am** **Exhibits Open**
Summit Pavilion
- 8:30 am – 10:00 am** **Morning Sessions**
- Behavior/Biology I
Crystal 1
 - The Results Are In: National, Regional, and Local Vector Control Capacity and Needs Symposium
Crystal 3
 - 9th Annual AMCA Arthropod Vector Highlights Symposium
Carson 1
 - Aerial Applications: Nuts and Bolts Discussion on Mosquito Control Operations Symposium I
Carson 4
 - UAS in Mosquito Control Symposium
Carson 3
- 10:00 am – 10:45 am** **Break/Exhibits Open**
Summit Pavilion
- 10:45 am – 12:15 pm** **Morning Sessions** *(continued)*
- Behavior/Biology II/ Adult Control I
Crystal 1
 - Innovative Products and Technologies for Mosquito Control Symposium
Crystal 3
 - Aquatic plant-associated mosquitoes Symposium
Carson 1
 - Aerial Applications: Nuts and Bolts Discussion on Mosquito Control Operations Symposium II
Carson 4
 - Operations
Carson 3
- 12:15 pm – 1:45 pm** **Lunch**
**On your own*

1:45 pm – 3:15 pm

Afternoon Sessions

- Adult Control II/Systematics
Crystal 1
- Disease/Vector Studies I
Crystal 3
- Larval Control/New Product Trials I
Carson 1
- Transforming surveillance and control effort using GIS/RS Symposium
Carson 4
- Latin American Symposium I
Carson 3

3:15 pm – 4:00 pm

Refreshment Break

Grand Salon

3:45 pm – 5:15 pm

Afternoon Sessions *(continued)*

- Education/Genetics
Crystal 1
- Disease/Vector Studies II
Crystal 3
- Public Relations
Carson 1
- New Product Trials II/Other
Carson 4
- Latin American Symposium II
Carson 3

6:00 pm – 7:00 pm

Pre-Banquet Social Grand Salon

7:00 pm – 9:30 pm

Banquet Reno *(Badge Required)*

8:30 AM - 10:45 AM

Exhibit Hall Open

10:00 AM - 10:45 AM

Break in Exhibit Hall

Summit Pavilion

8:30 AM - 10:00 AM*

Morning Sessions

**unless otherwise noted*

9th Annual AMCA Arthropod Vector Highlights Symposium

Moderator: Lee Cohnstaedt

8:30 AM - 10:00 AM

Meeting Room: Carson 1

8:30 171 Highlights of Vector Biology

Tara Thiemann

9:00 172 Highlights of control technology - 2022

Robert Aldridge

9:30 173 Highlights of European mosquito research

Alexandra Chaskopoulou

Aerial Applications: Nuts and Bolts Discussion on Mosquito Control Operations Symposium I

Moderator: Christopher Lesser

8:30 AM - 10:00 AM

Meeting Room: Carson 4

8:30 174 The use of AgDisp for predicting aerial adulticiding drift and deposit

Mark Latham

8:45 175 Emergency Response Activities for Mosquito Control after Hurricane Ian

Broox Boze

9:00 176 Evaluating Aerial ULV Applications in Salt Lake City

Greg White, Ary Faraji, Christopher Bibbs, Andrew Rivera

9:15 177 Taking flight with a varied fleet: advantages of operations with a De Havilland DHC-6-100 "Twin Otter" and a Bell 407 GXi

Kevin Caillouet, Nicholas DeLisi, Paul Spadoni, Josh Foulon, Calvin Smotherman

9:30 178 Barrier Treatment by Aerial Application for Control of Flooding Water Mosquitoes in Residential Areas

Rui-de Xue

9:40 179 US Air Force Aerial Spray: The role of the DoD in Pest Management Activities

Deanna Scheff, Karl Haagsma, Mark Breidenbaugh, Jennifer Remmers

Behavior/Biology I

Moderator: Gunter C. Muller

8:30 AM - 10:00 AM

Meeting Room: Crystal 1

- 8:30 180 Attraction of sand fly larvae *Phlebotomus papatasi* to larval feeding media and investigation of chemoattractants
Maia Tsikolia, Dimitris Tsaousoglou, Michail Miaoulis, Alexandra Chaskopoulou
- 8:40 181 A Closer Look: Field Wind Conditions Underlying Mosquito Responses
Neil Vickers, Agastya Balantrapu, Nick Conlin, Kirsten Meredith, Greg White, Ary Faraji, Marcus Hultmark
- 8:50 182 Bionomics and phenology of *Culiseta particeps* (Culicidae) mosquitoes in Lake County, California with considerations for changes in land-use and wildfire
Cassandra Urquhart, Brittany Nelms, Tara Thiemann, Michelle Koschik, Jamesina Scott
- 9:00 183 Automated differentiation of mixed populations of free-flying mosquitoes
Brian Johnson, Michael Weber, Martin Geier, Gregor Devine
- 9:10 184 The biology of mermithid nematodes and their prospective use in the biological control of mosquitoes
Manar Soliman
- 9:20 185 Attraction to host kairomones by male *Aedes aegypti* and *Aedes albopictus* mosquitoes in an air flow olfactometer.
Shawn Ward
- 9:30 186 Diel Activity Patterns of West Nile Virus Vectors in Fort Collins, Colorado
Broox Boze, Dominic Rose, Saul Lozano, Juan De Leon Rivera, John-Paul Mutebi
- 9:40 187 Mobile Insectaries: Mosquitos "On the Go"
Victoria Hyczyk
- 9:50 188 A high-tech cinematic journey through the behavioral compendium of *Sabethes* mosquitoes
Robert Hancock, Nicola Zaragoza, Taylor Boyd, Shannon MacFadden, Connor O'Brien-Stoffa

The Results Are In: National, Regional, and Local Vector Control Capacity and Needs Symposium

Moderator: Jennifer Gordon, Kyndall Braumuller

8:30 AM - 10:00 AM

Meeting Room: Crystal 3

- 8:30 189 Reactive Vector-Borne Disease Policy in the US Creates Opportunities for Improvement
Jennifer Gordon, Kyndall Dye-Braumuller, Kaci McCoy, Danielle Johnson, Rhoel David Ramos Dinglasan, Melissa Nolan

- 8:45 190 Vector Surveillance and Control Capacity at the Local Level
Angana Roy
- 9:00 191 Southeastern U.S. Vector Control Needs Assessment
Kyndall Dye-Braumuller, Jennifer Gordon, Danielle Johnson, Josephine Morrissey, Kaci McCoy, Rhoel David Ramos Dinglasan, Melissa Nolan
- 9:15 192 Results from a Research Survey: Capabilities and Capacities for Vector Control in Florida and Texas
Steve Peper
- 9:30 193 Survey of United States Mosquito Control Programs Reveals Opportunities to Improve the Operational Value of Centers for Disease Control and Prevention Bottle Bioassays
Stephanie Richards, Brian Byrd, Mark Breidenbaugh, Kurt Vandock
- 9:45 194 Panel Discussion - The Results Are In: National, Regional, and Local Vector Control Capacity and Needs

UAS in Mosquito Control Symposium

Moderator: Eric Haas Stapleton

8:30 AM - 10:00 AM

Meeting Room: Carson 3

- 8:30 195 Methods and applications for mosquito larval habitat identification and automated treatments
Joseph Civello
- 8:42 196 The role of drones in Collier Mosquito Control District's *Mansonia* control program
Rebecca Heinig, Peter Brake, Andrew Weiss, Rachel Bales, Keira Lucas
- 8:57 197 UAS License and CEU requirements for VCD's
Steve Shepherd
- 9:12 198 Upsizing The Fleet – Utilization of the DJI Agras T30 and MG-1S for Mosquito Control Applications in Salt Lake City, Utah
Bradley Sorensen, Michelle Christian, Matthew Marcusen
- 9:24 199 Larvicide Applications with Unmanned Aircraft Systems in Placer County, CA
Scott Schon, Ev Ortiz, Joel Beuttner
- 9:36 200 Hyllo - Precision UAS for Vector Control
Arthur Erickson
- 9:48 201 The PrecisionVision 35X UAS larvaciding and adulticiding for an integrated mosquito management approach
Bill Reynolds

10:45 AM - 12:15 PM*

Morning Sessions (Cont.)

**unless otherwise noted*

Aerial Applications: Nuts and Bolts Discussion on Mosquito Control Operations Symposium II

Moderator: Christopher Lesser

10:45 AM - 12:15 PM

Meeting Room: Carson 4

10:45 202 Aerial ULV in the Desert - Examining Efficacy

Kim Hung, Jacob Tarango, Marc Kensington, Arturo Gutierrez, Melissa Snelling, Jennifer Henke

11:00 203 Characterization of the spray distribution of Unmanned Aerial Spray Systems (UASS) and the development of turnkey systems for vector control

Jane Bonds, Brad Fritz, Harold Thistle

11:10 204 An Overview of the Aerial Adulticide and Aerial Larvicide Program of Butte County Mosquito and Vector Control District

Ryan Rothenwander

11:20 205 Shared aerial operations a unique endeavor

Herff Jones

11:30 206 Evolution of the aerial program at Collier Mosquito Control District

Rebecca Heinig, Keira Lucas, Patrick Linn

11:40 207 From mission planning to efficacy assessment, a review of Sacramento-Yolo Mosquito and Vector Control District's aerial ultra-low volume adult mosquito control program

Steven Ramos, Sarah Wheeler, Deborah Dritz, Mario Novelo Canto

11:50 208 Ultra Low Volume Naled Applications: Modeling and Literature Review Human Health Findings

Daniel Mendoza

12:00 209 Integrating sUAVs into Vector Control in order to increase efficiency and effectiveness, while remaining financially responsible

Edward Horvath, Dongbin "Don" Lee, Danta Smith

Aquatic plant-associated mosquitoes Symposium

Moderator: Kevin Caillouet

10:45 AM - 12:15 PM

Meeting Room: Carson 1

10:45 210 Evaluation of larval control strategies targeting *Coquillettidia perturbans* in Pasco County, Florida

Agne Prasauskas

11:00 211 Lee County Hyacinth Control District – 62 Years of Aquatic Vegetation Management

Colin Lewis

- 11:15 212 From Project to Program: Collier Mosquito Control District's Development of an Emergence Trap- based Surveillance Program for *Mansonia*
Rachel Bales, Peter Brake, Andrew Weiss, Jesse DeBella, Keira Lucas, Rebecca Heinig
- 11:30 213 The challenges of *Cq. perturbans* an important Eastern Equine Encephalitis vector in Massachusetts
Priscilla Matton, Todd Duval, Ellen Bidlack, Kaitlyn O'Donnell, Frank Cornine III
- 11:45 214 Overview of the Metropolitan Mosquito Control District's *Coquillettidia perturbans* control program.
Mark Smith
- 12:00 215 *Mansonia* species source reduction: The search for a habitat, host plant, and herbicide
Shannon O'Meara, Nicholas DeLisi, Sydney Johnson, Josh Foulon, Kevin Caillouet

Behavior/Biology II/Adult Control I

Moderator: Christopher S. Bibbs

10:45 AM - 12:15 PM

Meeting Room: Crystal 1

- 10:45 216 Improved Malaise Trap Systems for Sampling Mosquitoes
Gunter Muller, Rui-de Xue
- 10:55 217 How to assess the attraction distance of mosquitoes to blood and sugar feeding sources
Gunter Muller, Rui-de Xue
- 11:05 218 The Effect of sublethal doses of Glyphosate on the Development and Fitness of *Culex quinquefasciatus*
Mahmood Nikbakhtzadeh
- 11:15 219 Projecting spatial and ecological predictors of arbovirus transmission risk
Joseph McMillan, Luis Chaves, Philip Armstrong
- 11:25 220 Modifying the Standard Topical Bioassay: an Innovative Method for New Modes of Action
Joanna Tyszko
- 11:35 221 Managing Saltmarsh Mosquitoes...Outside of the Saltmarsh
Sarah McInnis, Shawna James
- 11:45 222 Will history repeat itself? Could *Aedes aegypti* be re-displaced by *Ae. albopictus* from the re-established area in the City of Gainesville, Florida?
Peter Jiang
- 11:55 223 Evaluation of Deltamethrin-Impregnated Screening for Localized Reduction of Mosquitoes in Deployed Settings
Jim Cilek, Jason Fajardo, Josh Weston, Mark Mitola, Adam Salyer

Innovative Products and Technologies for Mosquito Control Symposium

Moderator: Tianyun Su

10:45 AM - 12:15 PM

Meeting Room: Crystal 3

10:45 225 Contribution of Innovative Approaches for Sustainable Vector Control to Malaria Elimination in China

Qiyong Liu

10:55 226 Larvicidal Efficacy of Sumilarv WSPs Deployed in Catch Basins

Caleb Corona

11:05 227 Cloud based tool to swath characterize granular applications

Haley Johnson, Leanne Lake, Katie Williams, Banugopan Kesavaraju

11:15 228 The In2Care Mosquito Trap for precision mosquito management

Eva Buckner

11:25 229 Setting up barriers for *Aedes albopictus* in urban concrete jungles

Isik Unlu

11:35 230 Evaluating BG-Counter performance in surveilling Collier County's diverse mosquito populations

Atom Rosales, Noe Pineda, Robert Straser, Keira Lucas, Rebecca Heinig

11:45 231 Primary Uses of Drones in Mosquito Control and Becoming FAA-Certified

Madeleine Schmitz

11:55 232 Updates and Improvements to Caged Mosquito Field Trials

Andrew Rivera, Kattie Morris, Derek Fields, Yemi Bullen-McClain, Victoria Hyczyk, Madeleine Schmitz, Mackenzie Wilson

12:05 233 Laboratory and Field Evaluations on a Novel S-methoprene-based Product Line OmniPrene™

Tianyun Su

Operations

Moderator: Peter Jiang

10:45 AM – 12:15 PM

Meeting Room: Carson 3

10:45 234 Impoundment Management: An Historical Method of Source Reduction

Sherry Burroughs

10:55 235 Optimizing Forecasts for Sustainable Mosquito Control

Jason Farned

11:05 236 Green Pool Detection and Response: Changing Methods with Evolving Technology

Dan Fisher

11:15 237 PCR Lab Capabilities and Impact on Control and Applications Decisions

Lauren Lavezzi

- 11:25 238 A Case for Cohabiting: Mosquito Control and Endangered Species Can Live Together
Michelle Selander
- 11:35 239 Advances in automated identification and pooling technology
Hanan Lepek
- 11:45 240 Operational LiDAR use at Lee County Mosquito Control District
Laura Mattas, Aaron Lloyd, Nick Lefkow, Durrell Hagood, David Hoel
- 11:55 241 Making a case for Bio-controls: differentiating inundative versus classic strategies with the native entomopathogenic nematode, *Romanomermis culicivorax*
Anita Schiller
- 12:05 242 Teamwork, tech, and taxes to tackle tidal mosquitoes
Sarah Lawton, Michelle Robles, Mark Wieland, Joseph Huston, Ryan Clausnitzer, Eric Haas Stapleton

12:15 PM - 1:45 PM

Lunch on Own

1:45 PM - 3:15 PM*

Afternoon Sessions

**unless otherwise noted*

Adult Control II/Systematics

Moderator: Aaron Lloyd

1:45 PM - 3:15 PM

Meeting Room: Crystal 1

- 1:45 243 Mosquito Fauna (Diptera: Culicidae) of Rawalakot Azad Jammu and Kashmir, Pakistan
Umer Ayyaz Aslam Sheikh
- 1:55 244 Discovery of a New Black Fly Species *Simulium ustulatum* (Diptera: Simuliidae) from San Joaquin County, California, USA
Shaoming Huang, Peter Adler
- 2:05 245 Incorporating In2Care® Mosquito Trap into IPM toolbox to control invasive *Aedes* mosquitoes: Lessons from the West Valley region of the San Bernardino County
Jennifer Castellon, Solomon Birhanie, Mayra Macias, Michelle Brown
- 2:15 246 Preparation for targeted sterile insect technique to control invasive mosquitoes in California: mosquito colonization, gender emergence ratio and separating the males
Solomon Birhanie, Jennifer Castellon, Mayra Macias, Michelle Brown
- 2:25 247 Multi-centre discriminating concentration determination of broflanilide and potential for cross-resistance to other public health insecticides in *Anopheles* vector populations.
Louisa Messenger

- 2:35 248 Exposure of dengue-1 virus to *Aedes aegypti* and sensitivity to adulticides
Robert Aldridge, Barry Alto, Roxanne Connelly, Bernard Okech, Blair Siegfried, Kenneth Linthicum
- 2:45 249 Balancing the Benefits of Urban Development and Rural Agroecosystems with Public Health - the Continuing Saga of Insecticide Resistance
 Deborah Dritz, Sarah Wheeler, Gary Goodman
- 2:55 250 Efficacy of Ground ULV Adulticide Application: A Multi-Year Study in the Chicago Suburbs
Kristina Lopez, Patrick Irwin, Susan Paskewitz, Lyric Bartholomay

Disease/Vector Studies I

Moderator: Greg White

1:45 PM - 3:15 PM

Meeting Room: Crystal 3

- 1:45 251 Optimizing Trap Placement to Predict West Nile Virus Cases
Rebecca Smith, Anwasha Chakravarti, Bo Li, Dan Bartlett, Patrick Irwin
- 1:55 252 Development of Mosquito Surveillance System with Artificial Intelligence (AI) Techniques
Heeil Lee, Sun Ran Cho, Gi-Hun Kim, Sang-Joon Lee, Byoung-Kwan Cho, Dong-Sik Ryu, Rong-Jin Jung
- 2:05 253 Designing an Artificial Blood Meal (ABM) for the Feeding of *Aedes aegypti*
Alexander Weaver, Nagarajan Ramasamy Rajagopal, Christopher Batich, Roberto Pereira, Philip Koehler, David Schechter
- 2:15 254 The Dance of Two Agencies: Local Mosquito Abatement Program and Local Health Department's response to Potential Imported and Locally Acquired Mosquito-borne Disease Cases.
Milton Sterling, David Hoel, Aaron Lloyd
- 2:25 255 West Nile Virus Surveillance in Sentinel Chickens and Mosquitoes in Panama City Beach, Florida, from 2014 To 2020
Michael Riles, Eddie Summers, Bryan Giordano
- 2:35 256 Aging Field-Collected *Aedes aegypti* from the Florida Keys
Catherine Pruszyński
- 2:45 257 Microplastic ingestion alters the bacterial microbiota of *Aedes aegypti* and *Aedes albopictus*
Corey Brelsfoard, Carla-Cristina Edwards, Gabriella McConnel, Yaizeth Gurrola-Mares, Jaclyn Canas-Carrell
- 2:55 258 West Nile Virus in Tangipahoa Parish, Louisiana: Past and Present Mosquito Activity
Colby Colona
- 3:05 259 *Dirofilaria immitis* in invasive *Aedes* and native *Culiseta* species from Orange County, California
Daisy Rangel, Brenda Velis, Julia Ly, Cassandra Reyes, Tara Thiemann, Phillip Spinks, Amber Semrow

Larval Control/New Product Trials I

Moderator: Eva Buckner

1:45 PM - 3:15 PM

Meeting Room: Carson 1

- 1:45 260 The runnel concept, from past practice to expansion and recent application for marsh restoration, wildlife conservation and perhaps to mitigate climate change.
Patricia Dale
- 1:55 261 GLOBE Observer Mosquito Habitat Mapper: Mobile app surveillance and mitigation of larval habitats by citizen scientists
Russanne Low, Cassie Soeffing, Peder Nelson, Dan Killingsworth, Dan Bartlett
- 2:05 262 Natular DT (Spinosad, Clarke) control dynamics in an artificial yard drain system
Mario Novelo Canto, Steven Ramos, Daniela Arce, Sarah Wheeler
- 2:15 263 Simple, small and smart system for monitoring and control of dengue vector
Unsar Naeem-Ullah, Syed Farooq Shah, Shafia Saba, Sikander Ali, Shafqat Saeed, Tariq Butt
- 2:25 264 “If You Ain’t First, You’re Last”: A Spatial Approach to Pre-Hatch Larviciding
Dan Bartlett, Emmanuel Arebanmhen, Julia LaValle, Patrick Irwin
- 2:35 265 Sublethal effects of Pyriproxyfen and altosid against *Aedes aegypti*
Shabab Nasir
- 2:45 266 Updates on the ongoing development of IDX (MosID/TickeID), an imaging and identification device to support routine vector surveillance.
Adam Goodwin, Jewell Brey, Sanket Padmanabhan, Ghnana Madineni, Sameerah Talafha, Tristan Ford, Roy Faiman
- 2:55 267 Novel Tools for Increasing Mosquito Surveillance Efficiency: Using Machine Learning to Develop an *Aedes* Egg Counter App
Kyndall Dye-Braumuller, Adam Frederiksen, Lawrence Miao, Jun Zhou, Bob Doran, Andre Da Costa Da Silva, Alisa Nelson, Huixuan Li, Matthew DeGennaro, Sarah Gunter, Melissa Nolan
- 3:05 268 An update on MosquitoMate’s autocidal approaches to control *Aedes* mosquitoes
James Mains, Stephen Dobson, Karen Dobson

Latin American Symposium I

Moderator: Catalina Alfonso-Parra

1:45 PM - 3:15 PM

Meeting Room: Carson 3

1:45 269 Reduction Of Enzymatic Activity Of Glutathione S-Transferase And Mixed Function Oxidases In Response To Insecticide Exposure And Denv-2 Viral Challenge In *Aedes Aegypti*.

Alan Juache-Villagrana, Victoria Pando-Robles, Gustavo Ponce-Garcia, Beatriz Lopez-Monroy, Ildefonso Fernández-Salas, Adriana E. Flores

1:55 270 The activity of a lipid synthesis inhibitor, spiromesifen, in *Aedes aegypti* (L.) (Diptera: Culicidae).

Daniela Cerda-Apresa, Selene M. Gutierrez-Rodriguez, Jesus A. Davila-Barboza, Gustavo Ponce-Garcia, Beatriz Lopez-Monroy, Ma. Guadalupe Rojas-Verde, Iram Pablo Rodriguez-Sanchez, Adriana E. Flores-Suarez

2:05 271 Gene flow and kdr mutations in populations of *Triatoma dimidiata* (Latreille, 1811) (Hemiptera: Reduviidae, Triatominae) from Mexico.

Jesus A. Davila-Barboza, Mario Saucedo-Montalvo, Susana Favela-Lara, Beatriz López-Monroy, Gustavo Ponce-Garcia, Adriana E. Flores-Suarez

2:15 272 miRNomics universe of *Aedes aegypti* (L) (DIPTERA: CULICIDAE)

Iram Pablo Rodriguez-Sanchez, Daniel Rafael Saldaña-Torres, Diana Reséndez-Pérez, Adriana E. Flores-Suarez

2:25 273 Spatial And Temporal Dynamic of Kdr Mutations In *Aedes Aegypti* And Its Association with Sociodemographic and Environmental Characteristics

Mizael Gonzalez-Escandon, Beatriz Lopez-Monroy, Gustavo Ponce-Garcia, Selene M. Gutierrez-Rodriguez, Andre Castro-Bautista, Adriana E. Flores-Suarez

2:35 274 Socioeconomic and Environmental Factors associated with Risk of Dengue Fever Incidence in Guatemala (2017-2018)

Kasem Salim, Andrea Joyce

2:45 275 Population genetic structure of *Aedes aegypti* in El Salvador and Honduras

Andrea Joyce

2:55 276 Technological Innovation in Mosquito Monitoring (Species, Genus and Age)

Fabio Castelo Njaime

3:05 277 Insecticide susceptibility and resistance mechanisms in *Aedes aegypti* from urban and rural areas of Venezuela

Yasmin Rubio-Palis, Nicole Dzuris, Christopher Sandi, Rita Lucrecia Vizcaino-Cabarrus, Claudia Corredor-Medina, Jesus Alberto Gonzalez, Audrey Lenhart

Transforming surveillance and control effort using GIS/RS Symposium

Moderator: Mohamed Sallam

1:45 PM - 3:15 PM

Meeting Room: Carson 4

- 1:45 278 (Re)using published georeferences with Biodiversity Enhanced Location Services (BELS)
Robert Guralnick, Julie Allen
- 1:55 279 Employing Spatiotemporal Data for Disease and Non-Battle Injury Risk Reduction in Deployed Environments
Sean Beeman
- 2:05 280 Using locality and host data to predict tick parasitism on birds in the neotropics
Julie Allen
- 2:15 281 Global Mosquito Observations Dashboard (GMOD): integrating citizen science platforms to enable next-generation surveillance of invasive and vector mosquitoes
Ryan Carney, Connor Mapes, Johnny Uelmen, Russanne Low, Alex Long, Anne Bowser, David Durieux, Karlene Rivera, Berj Dekramanjian, Frederic Bartumeus, Daniel Guerrero, Carrie Seltzer, Farhat Azam, Sriram Chellappan, John Palmer
- 2:25 282 Leveraging GIS, remote sensing, and vector surveillance data to predict joint distributions of arbovirus mosquito vectors
Amely Bauer, Mohamed Sallam, Lindsay Campbell
- 2:35 283 High resolution ensemble species distribution models for mosquito vectors (Diptera:Culicidae)
Luis F Chaves
- 2:45 284 Web GIS – How A Single Source of Information Benefits Your Organization
Chad Minter
- 2:45 285 Co-occurrence probabilities between mosquito vectors of West Nile and Eastern equine encephalitis viruses using Markov Random Fields (MRFcov).
Mohamed Sallam
- 2:55 286 Methods helping to undercover hidden diversity
Stanislav Kolencik
- 3:05 287 Panel Discussion - Transforming surveillance and control effort using GIS/RS

3:15 PM - 3:45 PM

Break

Grand Salon

Sponsored By S.C. Johnson

3:45 PM - 5:15 PM*

Afternoon Sessions (Cont.)

**unless otherwise noted*

Disease/Vector Studies II

Moderator: Steve Peper

3:45 PM - 5:15 PM

Meeting Room: Crystal 3

- 3:45 288 Detection of Dengue Virus Serotype-1 in *Aedes aegypti* mosquitoes collected during an outbreak in Araraquara, Brazil using Integrated *Aedes aegypti* Monitoring (MI-Aedes) technology
Carlos Vagner Pecanha, Amanda Cupertino de Freitas, Ana Matos, Victor Maia, Bruna Souza, Broox Boze
- 3:55 289 Assessment of Positivity Rate of *Aedes Albopictus* And *Aedes Aegypti* In Western Province, Sri Lanka
M. M. S. M. B. Marasinghe, A. P. S. Perera
- 4:05 290 New distributional records and ecological notes of phlebotomine sandflies in northeastern Mexico
Eduardo Rebollar-Tellez, Gloria Elena Martínez-Pérez, Sergio Ibáñez-Bernal
- 4:15 291 Vector Surveillance and Control Response to a Japanese Encephalitis Outbreak in Humans and Commercial Pigs in Queensland, Australia.
Jonathan Darbro, Cassie Jansen, Kirsty Richards
- 4:25 292 Spatio-temporal Variations and Intraspecific Morphological and Morphometric Variabilities of *Culex* larvae during the Cold Dry Season in Khartoum Sudan
Samar Eisa, Rash Azrag
- 4:35 293 The Patterns of West Nile Mosquito Infection are Changing in Iberia Parish, Louisiana
David Martin
- 4:45 294 Evaluation of Co-Diagnostics Vector Smart™ North American Mosquito East and West Multiplex assays and CoDx Box™ Thermal Cycler platform
Kristy Burkhalter
- 4:55 295 Development of an all-in-one metabarcoding approach to mosquito and arbovirus surveillance
Brian Johnson, Melissa Graham, Nisa Suraj Nath, Elina Panahi, Gregor Devine

Education/Genetics

Moderator: James Clauson

3:45 PM - 5:15 PM

Meeting Room: Crystal 1

- 3:45 296 Full Steam Ahead: Destination Education
Cindy Mulla
- 3:55 297 Visual Accessibility of Media in Mosquito Control Public Education
Emily Evans

THURSDAY

- 4:05 298 Creating a School Education Program as a Non-Educator
Andrea McKinney
- 4:15 299 Title: Advancing Capacity for Behavior Change Communication and Community Engagement in Vector-Borne Disease Prevention: A Partnership Model
Amelia Greiner Safi, Emily Mader
- 4:25 300 Beyond the Booth: Increasing Engagement Through Interactive Activities
Hester Petropoulos
- 4:35 301 A Historical Review of Mosquito Surveillance and Control in the United States
Peter Obenauer
- 4:45 302 Mosquito Bloodmeal Identification: Multiplexing with MinION sequencing
Linda Kothera
- 4:55 303 High-throughput barcoding method of the genetic surveillance of insecticide resistance and species identification in *Anopheles gambiae* complex malaria vectors.
Louisa Messenger
- 5:05 304 Investigating molecular mechanisms of insecticide resistance in the Eastern Democratic Republic of the Congo.
Louisa Messenger

Latin American Symposium II

Moderator: Catalina Alfonso-Parra

3:45 PM - 5:15 PM

Meeting Room: Carson 3

- 3:45 305 Aplicaciones de los Datos Satelitales y Avances en la Salud Ambiental: Enfoque en Una Salud
Helena Chapman, Laura Judd, John Haynes
- 3:55 306 Isolation and characterization of bacteria from populations of *Aedes aegypti* (Diptera: Culicidae) and their role associated with susceptibility to the insecticides permethrin and deltamethrin.
Mayra A. Gómez-Govea, Gabriel Ruiz-Ayma, Iram Pablo Rodriguez-Sanchez, Luis Diego Carrillo-Gaytán, Ana Patricia Durán Nava, María de Lourdes Ramírez-Ahuja, Gerardo de Jesús Trujillo-Rodríguez
- 4:05 307 Species of mosquitoes (Diptera: Culicidae) with new records in Nuevo Leon, Mexico
Ildelfonso Fernández-Salas, Jorge J. Rodríguez-Rojas, Aldo Ortega-Morales, Rosa Sánchez-Casas
- 4:15 308 Susceptibility and resistance mechanisms in *Aedes aegypti* populations pre-intervention with pirimiphos-methyl by targeted indoor residual spraying (TIRS)
Alicia Méndez-Manzanero, Gabriela González-Olvera, Anuar Medina-Barreiro, Azael Che-Mendoza, Oscar David Kirstein, Pablo Manrique-Saide, Gonzalo M. Vazquez-Prokopec

- 4:25 309 The Newest State Level Vector Management Association in the Americas: The Puerto Rico Vector Management Association
Julianne Miranda-Bermúdez, Grayson Brown, Noemí Martínez-Tull
- 4:35 310 Survey of *Aedes aegypti* insecticide resistance mechanisms across the United States Virgin Islands in 2020
Juan De Leon Rivera, David Delgado, Aubrey Drummond, Krystal Seger, Ryan Hemme, Cassie Scott, Brett Ellis, Janet McAllister
- 4:45 311 Modifying the Standard Bottle Bioassay: Creative Solutions for Cielo
Joanna Tyszko
- 4:55 312 The effects of age on blood-feeding, blood-meal size, fertility, and sperm storage in females of the dengue vector mosquito *Aedes aegypti*.
Catalina Alfonso-Parra

New Product Trials II/Other

Moderator: Michael Doyle

3:45 PM - 5:15 PM

Meeting Room: Carson 4

- 3:55 313 Complete protection time of selected topical, spatial and electronic repellent devices tested against mosquitoes in Mali and Florida
Gunter Muller, Rui-de Xue
- 4:05 314 Biological Monitoring for Green Infrastructure Planning
Jennifer Breaux, James Beck, Claudia Riegel
- 4:15 315 Developments in mosquito control: Past, present and future - a manufacturer's perspective.
Raj Saran, Mark Hoppe, Laura Vavassori
- 4:25 316 New Mosquito on the Block: Tracking the Emergence of *Aedes Albopictus* in Chicago, 2016-2021
Alexandra Gagner, Claudia Blanco, Stephanie Black, Janna Kerins, Peter Ruestow
- 4:35 317 The Third Time is Not a Charm: The Third Year with *Aedes aegypti* in Moab, Utah
Michele Rehbein, Ary Faraji, Andrea Gloria-Soria, Shanon Amsberry
- 4:45 318 Towards the mosquito tricorder: rapid, accurate assessment of mosquitoes to radically improve efficiency of vector control programs.
Michael Reiskind, Brian Byrd, Scott Huffman, Stephanie Richards
- 4:55 319 Helicopters and Hymenoptera: Methods for monitoring non-target effects of aerial adulticides on local pollinators in Manatee County, Florida
Jacob Hart, Samantha Ramirez, Megan Walder, Jeffrey Davis, Mark Latham, Christopher Lesser

Public Relations

Moderator: Daniel Markowski

3:45 PM - 5:15 PM

Meeting Room: Carson 1

- 3:45 320 Customer Service for Success; don't ignore the phone
Danta Smith, Edward Horvath
- 3:55 321 All Aboard the Campaign Train: Getting Cities En Route to Effective Mosquito Control Outreach
Heather Hyland
- 4:05 322 The broad-spectrum approach to public outreach at the Lee County Mosquito Control District
Eric Jackson, Jamie Fowler, Amy Lucas, Ian Sharp
- 4:15 323 Wing Beats: A New Era
Dennis Moore
- 4:25 324 Mosquito Watch: Educating and Mobilizing Neighborhoods to Take Action Against Mosquitoes
Caroline Gongora
- 4:35 325 The Proof is in the Pole Banners
Meagan Luevano
- 4:45 326 Mosquito Moment: Creating our own Vector News Source to Notify Cities and Residents
Helen Kuan

6:00 PM - 7:00 PM

Pre-Banquet Social

Grand Salon

Sponsored By Azelis A&ES and Central Life Sciences

7:00 PM - 9:30 PM

Banquet

Reno

THURSDAY



89TH ANNUAL MEETING
At-A-Glance
Friday, March 3, 2023

8:30 am – 9:30 am **AMCA Annual Member Meeting**
Crystal 3

9:30 am – 12:30 pm **Board of Directors Meeting**
Crystal 1

Adjourn – See you in Dallas in 2024!

FRIDAY, FEBRUARY 28, 2023

8:30 AM - 9:30 AM AMCA Annual Members Meeting

Crystal 3

9:30 AM - 12:30 PM Board of Directors Meeting

AUTHOR INDEX

A

Acevedo, Carolina	74
Adler, Peter	244
Ain, Joshua	145
Aldridge, Robert	5, 85, 88, 169, 167, 172, 248
Alfonso-Parra, Catalina	115, 312
Ali, Sikander	263
Allan, Brian	43
Allen, Benjamin	P4
Allen, Julie	278, 280
Alomar, Abdullah	48, 70
Althoff, Rachel	145
Alto, Barry	248, 70, 48
Amare, Hiwot	P3
Amsberry, Shanon	317
Andrews, Elizabeth	67
Anyamba, Assaf	52, 138
Arce, Daniela	262
Arebanmhen, Emmanuel	264
Armstrong, Philip	219, 157
Aryaprema, Vindhya	80
Attardo, Geoffrey	40, 75
Avila, Frank W.	115
Awez, Dil	P16
Azam, Farhat	281
Azrag, Rash	292

B

Baber-Newton, Marcus	P11
Bajonero, Johanna	87
Balantrapu, Agastya	181
Baldwin, Rebecca	73
Baldwin, David	21
Bales, Rachel	94, 196, 212
Barker, Christopher	72, 126, 139
Barrand, Zachary	151
Barrera, Roberto	141
Barrientos, Luisa M	115
Bartholomay, Lyric	250
Bartholomay, Lyric	P24
Bartholomay, Lyric	18
Bartlett, Dan	251, 261, 264
Bartumeus, Frederic	281
Batich, Christopher	73, 163, 253, 169, 167
Bauer, Amely	P4
Bauer, Amely	282
Baxter, Lindsay	134, 135
Bayer, Barbara	85, 88 167, 169
Bear-Johnson, Mir	20
Beatty, Robert	90
Beck, James	314
Becker, Trish	37
Beehler, Angela	62
Beeman, Sean	279

Bekele, Fitsum	P3
Belkind, Benjamin	96
Benjamin, Seleena	97
Beuttner, Joel	199
Bibbs, Christopher	6, 146, 176
Bidlack, Ellen	213
Birhanie, Solomon	245, 245
Black, Stephanie	316
Blackman, Joseph	136
Blanco, Claudia	316
Bliss, John	33
Bloomquist, Jeffrey	169
Blore, Kai	73
Bonds, Jane	203
Borrero, Nexilianne	P6, P20
Bowman, Adam	163, 167, 169
Bowser, Anne	281
Boyd, Taylor	186, 188
Boze, Broox	175, 186, 288
Brake, Peter	196, 212
Braumuller, Kyndall	P9
Breaux, Jennifer	314
Breidenbaugh, Mark	179, 193
Brelsfoard, Corey	44, 257
Brey, Jewell	266
Brown, Grayson	309, P6, P20
Brown, Michelle	245, 246
Brown, David	59
Buckner, Eva	105, 136, 327, 228
Bullen-McClain, Yemi	232
Burkett-Cadena, Nathan	74
Burkhalter, Kristy	294
Burroughs, Sherry	234
Butt, Tariq	263
Byrd, Brian	193, 318
Byrne, Chris	92, 121

C

Cabrera, Aimee	136
Cabrera, Pablo	30
Caillouet, Kevin	83, 154, 177, 215
Camargo, Carolina	115, 312
Campbell, Lindsay	81, 282
Campbell, Lindsay	81, P4
Campos, Kauara	48
Canas-Carrell, Jaclyn	44, 257
Caragata, Eric	70
Cardenas, Hector	20, P13
Carder, Mark	P2
Carder, Jennifer	78
Carney, Ryan	281
Castellon, Jennifer	245, 236
Castro-Bautista, Andre	53, 54, 273
Cerda-Apresa, Daniela	270
Cesaris, Christina De	139
Chakravarti, Anwasha	251

Chapman, Claire	72
Chapman, Helena	305
Chaskopoulou, Alexandra	173, 180
Chaves, Luis	219, 283
Chellappan, Sriram	281
Che-Mendoza, Azael	308
Chen, Chao	85, 88
Chen, Ingrid	165
Chiong, Yanet	136
Cho, Byoung-Kwan	252
Christian, Michelle	198
Cilek, Jim	223
Ciota, Alexander	51
Civello, Joseph	195
Clausnitzer, Ryan	90, 242
Clifton, Mark	17, 25, 93, 106
Cloherty Duvernay, Erin	104, P17
Cloud, Rebecca	43
Coburn, Mary-Joy	29
Colamarino, Angelo	162
Colona, Colby	258
Colton, Leah	42
Conlin, Nick	181
Connelly, Roxanne	132, 248
Cornine III, Frank	213
Corona, Caleb	226
Corredor-Medina, Claudia	277
Coss, Mikki	111
Costa Da Silva, Andre Da	267
Cross, Chad	P3
Cummings, Robert	84, 108
Cupertino de Freitas, Amanda	288
Cutshall, Esther	8, P22

D

Dacko, Nina	76
Dale, Patricia	260
Darbro, Jonathan	291
Darrisaw, Constance	79
David-Kirstein, Oscar	308
Davila-Barboza, Jesus A.	54, 270, 271
Davis, Jeffrey	319
Day, Corey	41
De La Vega, Sumiko	158
De Leon Rivera, Juan	310
Debboun, Mustapha	91, P13, P14, P15
DeBella, Jesse	212
DeGennaro, Matthew	267
Dekramanjan, Berj	281
Delgado, David	310
DeLisi, Nicholas	83, 154, 177, 215
Devine, Gregor	183, 295
DeWitt, Ryan	21
Dickerson, Andrew	162
Diego Carrillo-Gaytán, Luis	306
Dill, Anna	P2

Dobson, Karen	268, P1
Dobson, Stephen	114, 268
Don Lee, Dongbin	209
Donahue, William	63
Doran, Bob	267
Dorus, Stephen	115
Doshi, Mona	162
Drexler, Anna	P12
Dritz, Deborah	207, 249
Drummond, Aubrey	310
Durán Nava, Ana Patricia	306
Durieux, David	281
Duval, Todd	213
Dye-Braumuller, Kyndall	189, 191, 267
Dzuris, Nicole	277

E

Edwards, Carla-Cristina	44, 257
Egizi, Andrea	45
Eisa, Samar	292
Elaine Allen, Isabel	165
Ellis, Brett	310
Epstein, Howard	168
Erickson, Daryn	150
Erickson, Arthur	200
Errasti, Pedro	136
Estep, Alden	77, 131, 133, 145, 327, P23
Evans, Emily	297

F

Fahad, Shah	39
Faiman, Roy	266
Fajardo, Jason	223
Faraji, Ary	1, 146, 176, 181, 317
Farned, Jason	235
Farooq, Muhammad	166
Farooq Shah, Syed	263
Favela-Lara, Susana	271
Fedirko, TJ	327
Felice, Michael	162
Felipe Ramírez-Sánchez, Luis	115
Fernández-Salas, Ildefonso	54, 269, 307
Fields, Derek	232
Fink, Sarah	14
Fisher, Dan	236
Flores-Suarez, Adriana E.	53, 54, 269, 270, 271, 272, 273
Foley, Edward	24
Foley, Nicole	P12
Ford, Morgan	144
Ford, Tristan	266
Foulon, Josh	83, 177, 215
Fowler, Jamie	322
Francis, Dustan	P11
Frank, Ashlea	23
Frederiksen, Adam	267
Fritz, Brad	203

Fritz, Jason 28, 112

G

Gagner, Alexandra 316
Garcia-Bernal, Mitzi 53
Gaus-Bowling, Teresa P11
Gebresilassie, Araya P3
Geier, Martin 183
Gerry, Alec 46, 98
Ghouati, Kamil P18
Gibson, Seth 52, 85, 88, 167, 169
Giordano, Bryan 255, P4
Gloria-Soria, Andrea 317
Golden, Frances 167, 169
Goldmann, Aviva 102
Gómez-Govea, Mayra A. 306
Gongora, Caroline 324
Gonzalez, Jesus Albert 277
Gonzalez-Escandon, Mizael 273
González-Olvera, Gabriela 308
Goodman, Gary 36, 249
Goodwin, Adam 266
Gordon, Jennifer 189, 191
Graham, Melissa 295
Gray, Elmer P4
Greiner Safi, Amelia 299
Grippin, Crystal 20, P14, P15
Guadalupe Rojas-Verde, Ma. 270
Guerrero, Ashley P5
Guerrero, Daniel 281
Gunter, Sarah 267
Guralnick, Robert 278
Gurrola-Mares, Yaizeth 257
Gutierrez, Arturo 202
Gutierrez-Rodriguez, Selene M.. 270, 273

H

Haagsma, Karl 179
Haas Stapleton, Eric 90, 242
Hagood, Durrell 240
Hahn, Daniel 85, 88
Hailu, Girma P3
Hancock, Robert 188
Harbison, Justin 13, 106
Harrington, Laura 7, 134
Hart, Jacob 127, 319
Hawkes, Tony 21
Haynes, John 137, 305
Healy, Kristen 104, P21
Heft, Dave 99
Heinig, Rebecca 94, 196, 206, 212, 224, 230,
Hemme, Ryan 310
Henke, Jennifer 46, 125, 147, 202
Hepp, Crystal 144, 153
Hoel, David 68, 79, 86, 87, 240, 254
Hogan, Jeremy 27

Holbert-Watson, Zach	14
Holeman, Jodi	113
Holiday, Olivia	144
Hoppe, Mark	315
Horvath, Edward	209, 320
Howard, Rick	89
Hribar, Lawrence	12
Huang, Shaoming	244
Huffman, Scott	318
Huijben, Silvie	145, P23
Hultmark, Marcus	181
Hung, Kim	46, 202
Huston, Joseph	242
Hyland, Heather	321
Hyczyk, Victoria	187, 232

I

Ibáñez-Bernal, Sergio	290
Irwin, Patrick	130, 250, 251, 264

J

Jack, Cameron	73
Jackson, Eric	68, 322
James, Shawna	221
Janowiecki, Mark	104
Jansen, Cassie	291
Jennings, Susan	22
Jensen, Brook	145, P23
Jesús Trujillo-Rodríguez, Gerardo de	55, 57, 306
Jewett, Mollie	162
Jiang, Peter	88, 222
Jiménez-Martínez, Mariana Lizbeth	55, 56, 57
Johnson, Danielle	189, 191
Johnson, Kurt	139
Johnson, Sydney	215
Johnson, Brian	183
Johnson, Haley	227
Johnson, Brian	295
Jones, Herff	205
Joyce, Andrea	274, 275
Juache-Villagrana, Alan	269
Judd, Laura	305
Jung, Rong-Jin	252

K

Kading, Rebekah	47
Kalmouni, Joshua	145
Kamande, Dismas	119
Kariyat, Rupesh	P5
Kaur, Satinderpal	P5
Kelly, Erin	75
Kennedy, Theodore	144
Kensington, Marc	202
Kerins, Janna	316
Kesavaraju, Banugopan	95, 96, 119, 120, 123, 227
Khan, Ata-ur-Rehman	P16

Killingsworth, Dan	61, 69, 261, P4
Kim, Brian	162
Kim, Gi-Hun	252
Kimball, Piper	20
Kinde, Solomon	P3
Kindu, Bezabih	P3
King, Robin	26, 66
Klein, Barrett	P24
Kline, Daniel	163, 167, 169
Kline, Jedidiah	88, 164
Kline, Daniel	161
Kluh, Susanne	89
Koehler, Philip	73, 253
Kolencik, Stanislav	286
Kollars, Kathryn	P2
Kollars, Thomas	P2
Koschik, Michelle	182
Kothera, Linda	302, P12
Krueger, Laura	84, 108
Kuan, Helen	326

L

Lake, Leanne	95, 120, 122, 123, 227
Lassen, Joshua	42
Latham, Mark	127, 174, 319
LaValle, Julia	264
Lavezzi, Lauren	237
Lawton, Sarah	242
Leal, Andrea	111
Lee, Sang-Joon	252
Lee, Yoosook	P4
LEE, HEEIL	252
Lefkow, Nick	240
Lenhart, Audrey	277
Leon Rivera, Juan De	186
Lepek, Hanan	116, 239
Lesser, Christopher	127, 319
Lewis, Colin	211
Li, Bo	251
Li, Huixuan	267
Linn, Patrick	206
Linthicum, Kenneth	5, 52, 85, 88, 167, 169, 248
Liu, Qiyong	225
Lloyd, Aaron	68, 79, 86, 87, 240, 254
Lobo, Neil	165
Long, Alex	281
Lopez, Kristina	250
Lopez-Monroy, Beatriz	53, 54, 269, 270, 271, 273
Lourdes Ramírez-Ahuja, María de	55, 56, 306
Low, Russanne	261, 281
Lozano, Saul	186, P12
Lucas, Amy	322
Lucas, Keira	94, 196, 206, 212, 224, 230
Luevano, Meagan	325
Ly, Julia	259

M

MacFadden, Shannon	188
Macias, Mayra	245, 246
Mack, Lindsey	40
Mackay, Andrew	43
Mader, Emily	299
Madineni, Ghnana	266
Maia, Victor	288
Mains, James	268
Majambere, Silas	119
Manrique-Saide, Pablo	308
Mapes, Connor	281
Marasinghe, M. M. S. M. B.	289
Marcusen, Matthew	198
Markowski, Daniel	60
Martin, David	293
Martinelle Franca, Caio	77
Martinez, Perla Cecilia	53, 54
Martínez-Pérez, Gloria Elena	290
Martínez-Tull, Noemí	309
Mashlawi, Abadi	P7
Matos, Ana	288
Mattas, Laura	240
Matton, Priscilla	213
McAllister, Janet	104, 132, 310
McConnel, Gabriella	44, 257
McCoy, Kaci	189, 191
McInnis, Sarah	221
McKinney, Andrea	298
McMillan, Benjamin	167
McMillan, Joseph	157, 219
McNamara, Daniel	P21
McPhatter, Lee	P2
Medina, Joanelis	P6
Medina-Barreiro, Anuar	308
Meek, Jillian	31
Mekuriaw, Wondemeneh	P3
Méndez-Manzanero, Alicia	308
Mendoza, Daniel	208
Meredith, Kirsten	181
Messenger, Louisa	247, 303, 304, P3
Miao, Lawrence	267
Miaoulis, Michail	180
Miller, Sarah	165
Minteer, Chad	284
Miranda-Bermúdez, Julieanne	309, P6, P20
Mitola, Mark	223
Moore, Jason	119
Moore, Sarah	119, 165
Moore, Dennis	323
Moreno, Bianca	88
Morgan, Timothy	84, 89, 108
Morreale, Rachel	86, 87

Morris, Kattie	232
Morrissey, Josephine	191
Mortola, Billy	158
Moss, Crystal	P11
Moyung, Eric	P22
Mulla, Cindy	296
Muller, Gunter	216,217, 313
Mulualem, Yibeyin	P3
Mustard, Julie	P5
Mut, Michael	32
Mutebi, John-Paul	186

N

Naeem-Ullah, Unsar	263, P16
Nakata, Mark	P14, P15
Narvaez, Zoe	45
Nasir, Shabab	159, 170, 265
Nelms, Brittany	182
Nelson, Alisa	267
Nelson, Peder	261
Nguyen, Kiet	108
Nguyen, Valerie	P4
Nguyen, Kiet	84
Nickell, Zachary	94
Nikbakhtzadeh, Mahmood	218
Njaime, Fabio Castelo	276
Nolan, Melissa	189, 191, 267, P9
Norris, Edmund	10, 164
Novelo Canto, Mario	207, 262
Nyman, Benjamin	124

O

Obenauer, Peter	301
O'Brien-Stoffa, Connor	188
O'Donnell, Kaitlyn	213
Okech, Bernard	248
Okumu, Fredros	165
Oliveira Carvalho, Danilo de.	87
Olson, Michael	157
O'Meara, Shannon	215
Ortega-Morales, Aldo	307
Ortiz, Ev	199
Osorio, Jessica	115
Ottea, James	104, P17

P

Paaijmans, Krijn	145
Padmanabhan, Sanket	266
Paldi, Nitzan	117
Palmer, John	281
Panahi, Elina	295
Panarallo, Andrew	162
Pando-Robles, Victoria	269
Parker Crockett, Casey	77
Paskewitz, Susan	250
Peck, George	100

Pemrick, Tommy	15
Peper, Steve	9, 192
Pereira, Roberto	73, 253
Perera, A. P. S.	289
Petrie, William	136
Petropoulos, Hester	300
Petruff, Tanya	157
Pierce, Judith	90
Pineda, Noe	230
Ponce-Garcia, Gustavo	53, 54, 269, 270, 271, 273
Popko, David	103
Posey, Tanya	89
Prasauskas, Agne	210
Price, Dana	45
Price, Jacob	P11
Pruszyński, Catherine	256

Q

Qualls, Whitney	73, 80, 85, 178, P19
-----------------	----------------------

R

Rafael Saldaña-Torres, Daniel	272
Rahim, Junaid	P8
Rajwana, Ishtiaq	P16
Ramasamy Rajagopal, Nagarajan	163, 167, 169, 253
Ramirez, Samantha	127, 319
Ramírez-Ahuja, María de Lourdes	57
Ramos, Steven	207, 262
Ramos Dinglasen, Rhoel David	189, 191
Ran Cho, Sun	252
Ranck, Shawn	139
Rangel, Daisy	259
Ranson, Beth	92, 121
Rebollar-Tellez, Eduardo	290
Reeves, Lawrence	3, 317
Reiskind, Michael	16, 318
Remmers, Jennifer	179
Reséndez-Pérez, Diana	272
Reyes, Kassandra	259
Reynolds, Bill	20, 201, 291
Richards, Stephanie	193, 318
Ridenour, Chase	144
Riegel, Claudia	104, 314
Riles, Michael	255, P4
Rivera, Andrew	176, 281
Rivera, Andrew	15
Robles, Michelle	242
Rodríguez-Rojas, Jorge J.	307
Rodriguez-Sanchez, Iram Pablo	55, 56, 57, 270, 272, 306
Roe, Chandler	144
Romero-Weaver, Ana	P4
Rosales, Atom	94, 230
Rose, Dominic	186
Rothenwander, Ryan	204
Rowley, Lisa	154
Roy, Angana	190

Royster, Emma	P23
Rubio-Palis, Yasmin	277
Ruestow, Peter	316
Ruiz-Ayma, Gabriel	306
Ryan, Bonnie	158
Ryu, Dong-Sik	252

S

Saba, Shafia	263
Saba, Shafia	P16
Sánchez-Rolón, Cristhian	P6, P20
Saeed, Shafqat	263, P16
Sahl, Jason	144
Salim, Kasem	274
Sallam, Mohamed	82, 282, 285
Salyer, Adam	223
Sánchez-Casas, Rosa	307
Sandi, Christopher	277
Sanscrainte, Neil	131, 133
Saran, Raj	315
Saucedo-Montalvo, Mario	271
Schechter, David	253
Scheff, Deanna	179
Schiller, Anita	241
Schmitz, Madeleine	231, 232
Schon, Scott	199
Scott, Cassie	132, 310
Scott, Jamesina	182
Seavey, Corey	162
Seger, Krystal	310
Selander, Michelle	238
Seltzer, Carrie	281
Semrow, Amber	84, 89, 108, 259
Shanmugam, Laxmi	160
Sharp, Ian	322
Sheikh, Umer Ayyaz Aslam	243
Shepard, John	157
Shepherd, Steve	89, 197
Shimola, Jennifer	109
Siegfried, Blair	248
Simpson, Jody	139
Sisay, Chalachw	0
Sloyer, Kristin	74
Smith, Danta	209
Smith, John	35
Smith, Mark	149, 214
Smith, Rebecca	251
Smith, Danta	320
Smotherman, Calvin	83, 177
Snelling, Melissa	202
Soeffing, Cassie	261
Soliman, Manar	184
Solomon, Maurice	167, 169
Sorensen, Bradley	198
Souza, Bruna	288
Spadoni, Paul	177

Spinks, Phillip	259
Spurlin, Chance	145
Stenhouse, Steven	87
Sterling, Milton	254
Straser, Robert	94, 224, 230
Su, Tianyun	156, 233
Sublett, Jacob	110
Summers, Eddie	255
Sun, Sokanary	84, 89, 108
Suraj Nath, Nisa	295
Susong, Katie	18
Swai, Kyeba	165

T

Talafha, Sameerah	266
Tarango, Jacob	202
Tavares, Yasmin	P4
Teoh, Guat Ney	97
Thiemann, Tara	46, 158, 171, 182, 259, P22
Thistle, Harold	95, 203
Tisdale, Brian	34
Townsend, John	129, 152
Tremblay, Nicolas	89
Troupin, Andrea	P14, P15
Trout, Rebecca	41
Trujillo-Rodríguez, Gerardo de Jesús	56
Tsaousoglou, Dimitris	180
Tsecouras, Julie	46
Tsikolia, Maia	180
Tucker, Bradley	18, P24
Turell, Michael	50
Tyler-Julian, Kara	79
Tyszko, Joanna	220, 311

U

Uelmen, Johnny	281
Unlu, Isik	136
Upshaw-Bia, Kelly	144
Urbanz, Jennifer	144
Urquhart, Cassandra	182

V

Vagner Pecanha, Carlos	288
Vaidyanathan, Rajeev	11, 118
Valdepena, Tim	139
Valdivias, Javier	P14, P15
VandenBrooks, John	143
Vandock, Kurt	193
Vasquez, Chalmers	136
Vasquez, Gissella	155
Vaughan, Jefferson	49
Vavassori, Laura	315
Vazquez-Prokopec, Gonzalo M.	308
Velis, Brenda	259
Verocai, Guilherme	144
Vetrone, Steven	89

Vickers, Neil	181
Villa-Arias, Sara	115
Vitek, Christopher	P5
Vizcaino-Cabarrus, Rita Lucrecia	277

W

Wahl, Jeffrey	167, 169
Walder, Megan	319
Walette, Dennis	2, 38
Wang, Xiaoming	84, 108
Wangen, Catherine	43
Ward, Shawn	185
Wasi Ahmad, Nazni	97
Weaver, Alexander	253
Weber, Michael	19, 183
Weiss, Andrew	196, 212
Wekesa, J. Wakoli	64
Wells, Lincoln	139, 223
Whatling, Paul	58
Wheeler, Sarah	140, 207, 249, 262
White, Greg	146, 176, 181
Why, Adena	101
Wieland, Mark	242, P25
Will, James	129
Willenberg, Bradley	162
Williams, Katie	4, 77, 120, 123, 227
Williams, Tre	77
Wilson, Mackenzie	232
Wilson, Sara	71
Winokur, Olivia	72
Wisely, Samantha	74
Wittie, Jeremy	65
Wossen, Mesfin	P3
Woyessa, Adugna	P3

X

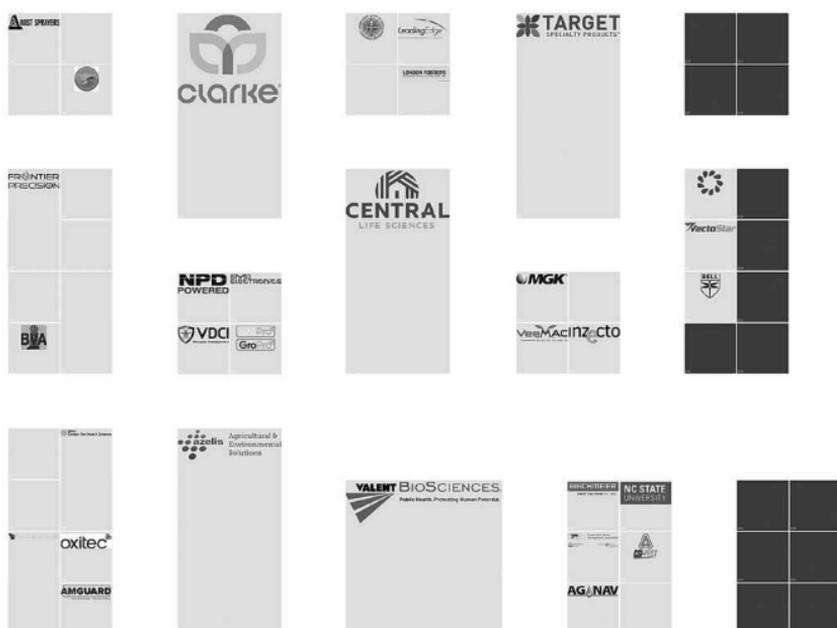
Xue, Rudy	73, 85, 166, 178, 216, 217, 313, P19
---------------------	--------------------------------------

Z

Zaragoza, Nicola	188
Zellars, Kia	P9
Zhou, Jun	267
Ziemer, Tim	19

EXPO HALL *Summit Pavilion*

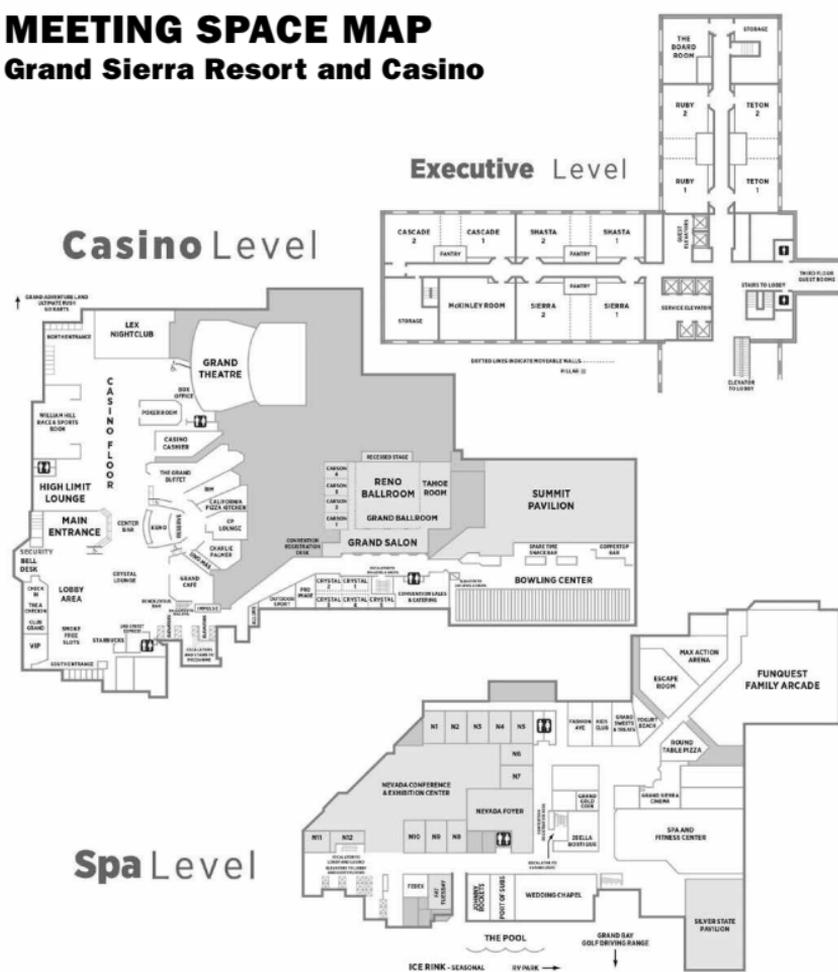
Grand Sierra Resort and Casino

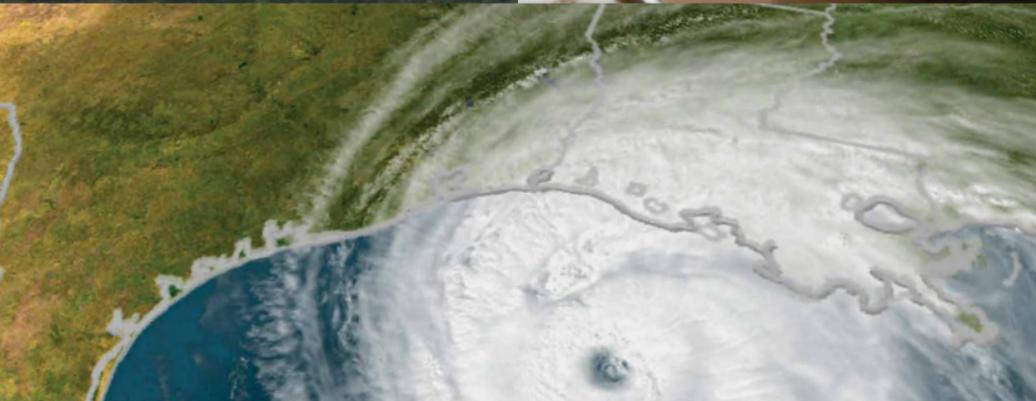


Exhibitor Key	Booth #
A1 Mist Sprayers	123
Azelis Agricultural & Environmental Solutions	207
AGNAV INC	401
AMCA Young Professionals	220
AMGUARD Environmental Technologies	200
Birchmeier/ITB Company, Inc.	405
BVA Oils	111
Central Life Sciences	317
Clarke	223
Co-Dx	107
Diversity & Inclusivity Sub Committee	500
EMD Electronics	312
EntoExchange	113
Entomological Society of America	323
Envu	423
FMC	212
Frontier Precision, Inc.	117
GROPRO Corp	310
INZECTO	510
IOX Innovations	222
Leading Edge	422
LONDON FOG	420
MGK	413

NC State University	504
NPD Products Ltd.	213
Oxitec, Ltd.	202
LAC - Puerto Rico Vector Management Association	403
Rad Source	121
S.C. Johnson & Son, Inc.	206
Senecio Robotics	214
Summit Chemical Company	321
Target Specialty Products	423
LAC - Texas Mosquito Control Association	512
Valent BioSciences	305
Vectech	105
Vector Disease Control International (VDCI)	211
VeeMAC	411
Veseris	103

MEETING SPACE MAP Grand Sierra Resort and Casino





**In an unpredictable year,
be ready for anything.**

Emergency Response Mosquito Management Services

- Federal, State, and Local Coordination
- Seamless Preparation
- Aerial Applications
- Navigating Emergency Funding
- PR and Media Support

**Don't wait until disaster strikes.
Be prepared. Call today.**

**Vector Disease Control International
1.800.413.4445 | vdci.net**

**Come see us at
booth #211**



Let's protect the spaces we live in — together

 DELTAGARD®

 PERMANONE®

 AQUA
RESLIN®

 SUSPEND®
PolyZone®

 IMPERIUM

