ALTOSID® P35, THE EASY-TO-USE, 35-DAY RESIDUAL MOSQUITO LARVICIDE.

Our founders discovered the molecule (S)-methoprene – the original insect growth regulator (IGR) for environmentally compatible mosquito control. Altosid® P35 granules – our latest innovation – provide easy equipment calibration and accurate application thanks to their uniform spherical design, in addition to 35 days of control during continuous flooding.

To learn more about Altosid® P35 granules, come see us at Booth #301, or visit www.CentralMosquitoControl.com.
### AMCA 85th Annual Meeting At-a-Glance

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<tr>
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<th>Time</th>
<th>Session</th>
</tr>
</thead>
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<tr>
<td>Mon Feb 25</td>
<td>9:00 am – 3:00 pm</td>
<td>Pre-Conference Workshop: Learn the CDC Bottle Bioassay (Hibiscus) – Pre-registration required</td>
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<tr>
<td></td>
<td>10:00 am - 6:30 pm</td>
<td>Registration and Internet Hub (Grand Sierra Foyer)</td>
</tr>
<tr>
<td></td>
<td>1:00 pm - 5:30 pm</td>
<td>Speaker Ready Room (Bonaire 5)</td>
</tr>
<tr>
<td></td>
<td>1:00 pm - 5:30 pm</td>
<td>Committee Meetings (Bonaire 1, 2, 3, 4)</td>
</tr>
<tr>
<td></td>
<td>2:00 pm - 4:00 pm</td>
<td>Poster Set-Up (Grand Sierra D-I)</td>
</tr>
<tr>
<td></td>
<td>5:00 pm - 8:00 pm</td>
<td>Grand Opening of the Exhibit Hall and Welcome Reception – Badge Required for Entry (Grand Sierra D-I)</td>
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<tr>
<td>Tues Feb 26</td>
<td>7:00 am - 5:30 pm</td>
<td>Registration and Internet Hub (Grand Sierra Foyer) Speaker Ready Room (Bonaire 5)</td>
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<td>8:00 am - 12:00 pm</td>
<td>Plenary Session (Grand Sierra A-C)</td>
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<td>10:00 am - 10:30 pm</td>
<td>Refreshment Break (Grand Sierra Foyer)</td>
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<td></td>
<td>12:00 pm - 1:45 pm</td>
<td>President's Luncheon and Exhibits Open – Badge Required for Entry (Grand Sierra D-I)</td>
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<td></td>
<td>1:45 pm - 3:15 pm</td>
<td>Mosquito Lightning Symposium (Antigua 1)</td>
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<td>3:15 pm - 4:00 pm</td>
<td>Refreshment Break in Exhibit Hall/Ice Cream Social – Ticket Required (Grand Sierra D-I)</td>
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<tr>
<td></td>
<td>4:00 pm - 5:30 pm</td>
<td>6th Arthropod Vector Highlights Symposium (Antigua 1)</td>
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<tr>
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<td>5:45 pm - 7:15 pm</td>
<td>Latin American Discussion (Antigua 1)</td>
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<tr>
<td>Wed Feb 27</td>
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<td>8:30 am - 5:00 pm</td>
<td>Trustee/Commissioner Tour (Off-Site Event) – Ticket Required</td>
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<td>8:30 am - 10:00 am</td>
<td>Latin American Student Competition Symposium (Antigua 1)</td>
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<td>10:00 am - 10:45 pm</td>
<td>Refreshment Break in Exhibit Hall (Grand Sierra D-I)</td>
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<tr>
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<td>10:45 am - 12:15 pm</td>
<td>Latin American Symposium I (until 12:25 pm) (Antigua 1)</td>
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<td>12:15 pm - 1:45 pm</td>
<td>Poster Session Luncheon – Badge Required for Entry (Grand Sierra D-I)</td>
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<td>1:45 pm - 3:15 pm</td>
<td>Latin American Symposium II (until 3:25 pm) (Antigua 1)</td>
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<td>Refreshment Break in Exhibit Hall (Grand Sierra D-I)</td>
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<td>Latin American Symposium III (Antigua 1)</td>
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<td>5:30 pm - 6:30 pm</td>
<td>Young Professionals Social (Grand Sierra B) – Invitation Only Event</td>
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<td>Thu Feb 28</td>
<td>7:30 am - 1:00 pm</td>
<td>Registration and Internet Hub (Grand Sierra Foyer) Speaker Ready Room (Bonaire 5)</td>
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<td>8:30 am – 10:45 am</td>
<td>Exhibits Open (Grand Sierra D-I)</td>
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<td>8:30 am - 10:00 am</td>
<td>Social Media and Mosquito Control Symposium (until 10:05 am) (Antigua 1)</td>
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<td>Refreshment Break in Exhibit Hall (Grand Sierra D-I)</td>
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<td>10:45 am - 12:00 pm</td>
<td>AMCA Annual Member Meeting (Antigua 1)</td>
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<td>1:30 pm - 4:00 pm</td>
<td>Field Day (Onsite – Pavilion and Overflow Lot)</td>
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<td>4:00 pm - 6:00 pm</td>
<td>Leisure Time (No official AMCA sessions/events)</td>
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<td>6:00 pm - 7:00 pm</td>
<td>Pre-Banquet Social (Grand Sierra Foyer)</td>
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<td>7:00 pm - 9:30 pm</td>
<td>Banquet – Ticket Required (Grand Sierra D)</td>
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<tr>
<td>Fri Mar 1</td>
<td>7:30 am - 11:00 am</td>
<td>Registration and Internet Hub (Grand Sierra Foyer)</td>
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<td>7:30 am – 11:00 am</td>
<td>Board of Directors Meeting (Hibiscus)</td>
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<td>8:30 am - 10:00 am</td>
<td>Water Management Symposium I (Antigua 1)</td>
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<td>Refreshment Break (Grand Sierra Foyer)</td>
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<tr>
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<td>10:30 am - 12:00 pm</td>
<td>Water Management Symposium II (Antigua 1)</td>
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<tr>
<td></td>
<td>12:00 pm</td>
<td>Meeting Adjourns – See You in Portland, Oregon in 2020!</td>
</tr>
</tbody>
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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 (may be different from start-end time in main heading, check each symposium/session)

Room Location

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 and all other numbers are oral presentations. If there is no number listed, there is no abstract associated with that particular presentation.

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

All author affiliations are listed in the online abstract book.

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

Message from the President
William E. Walton

It is my distinct pleasure to welcome you to the 85th annual meeting in beautiful Orlando. The AMCA comprises a diverse membership and is dedicated to providing leadership, education, and information on all aspects of mosquito control. The annual meeting provides us the opportunity to share our experiences, as well as to learn, discuss, and formulate ways forward using the latest developments in mosquito and vector control. Ary Faraji, AMCA Vice President, has arranged an exceptional program that you will find to be informative and stimulating. The response to the requests for submitted symposia, oral and poster presentations was the greatest to date! There are 18 symposia including nearly 350 oral presentations as well as more than 60 posters.

Special recognition goes to the Local Arrangements Committee chaired by Rudy Xue and Aaron Lloyd, Brian Byrd for organizing the Student Competition, Jennifer Henke for organizing the poster session, Lee Cohnstaedt for organizing the Latin American Symposia and Kristy Burkhalter for coordinating the activities for AMCA's Young Professionals. A special thanks to Heather Gosciniak, Brittany Noll and Jeana Hoffman at Association Headquarters for their assistance with all aspects of the scientific program and the meeting's activities.

Please take time to visit the booths displaying the products and services offered by the vendors and thank our exhibitors for their support of the AMCA. A special thanks goes to the vendors who provided stipends for the Young Professionals Industry Shadowing Program. Thirteen of our YPs were awarded stipends to attend this year’s meeting and will work with their sponsors during the meeting.

Thank you for attending! While you are in Orlando take the opportunity to explore “The Theme Park Capital of the World” before and after the meeting. Diagon Alley awaits!

Bill Walton, AMCA President
AMCA 2018-2019 Board of Directors

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Annual Meeting Committee
Jason Kinley

Program Subcommittee
Ary Faraji

Archives Committee
Eric Williges

Bylaws & Policy Committee
Janet McAllister

Executive Committee
Bill Walton

Finance Committee
Gary Hatch

Legislative & Regulatory Committee
Angela Beehler

ESA Subcommittee/Pollinators Subcommittee
Michael Riles

Chemical Control Subcommittee
Karl Malamud-Roam

Clean Water Act Subcommittee
Gary Goodman

Pesticide Environmental Stewardship Program (PESP) Subcommittee
Gabrielle Sakolsky

Washington Conference Subcommittee
Wayne Gale

Federal Lands Subcommittee
William Meredith

Federal Funding Subcommittee
Gary Goodman

Unmanned Aircraft Systems Subcommittee
Joel Buettner

Membership Committee
Heather Gosciniak
Nominating/Awards Committees
Wayne Gale

John N. Belkin Award Subcommittee
Larry Hribar

Industry Award Subcommittee
Jason Trumbetta

Boyd-Ariaz Grassroots Award Subcommittee
Steve Mulligan

Public Relations Committee
Joe Conlon

Publications Committee
Steve Presley

JAMCA Editorial Board
Harry Savage

Newsletter Editorial Board
Clark Wood

Special Publications Subcommittee
Whitney Qualls

Science & Technology Committee
Seth Britch

Training & Member Education Committee
Isik Unlu

Young Professionals Committee
Edmund Norris
2019 Planning Committees

ANNUAL MEETING COMMITTEE
Jason Kinley, Chair, AMCA President-Elect
Bill Walton, AMCA President
Ary Faraji, AMCA Vice President
Jason Trumbetta, AMCA Board, Industry Director
Stormy Freese, Education Day Coordinator

PROGRAM COMMITTEE
Ary Faraji, Chair, AMCA Vice President
Lee Cohnstaedt, Latin American Symposium
Brian Byrd, Student Competition
Diann Crane, Program Book Copy Editor

LOCAL ARRANGEMENTS COMMITTEE
Aaron Lloyd, Co-Chair, Pasco County MCD
Rudy Xue, Co-Chair, Anastasia Mosquito Control District

AMCA HEADQUARTERS STAFF
Heather Gosciniax, Executive Director
Brittany Noll, Client Services Coordinator
Jeana Hoffman, Meeting Coordinator
Justin Martin, Accountant
Amy Breslin, Data Entry
Meeting Sponsors

AMCA is deeply appreciative of and proud to acknowledge the following industry supporters of the 85th Annual Meeting

DIAMOND LEVEL SUPPORTERS

[Image]

Welcome Reception
Meeting Bags
Program Book Inside Front Cover
Meeting Bag Insert
Hotel Keycards
AMCA Lounge
Young Professional Industry Shadowing Program Sponsor of Kristina Lopez

[Image]

Convention West Entrance Door Clings & Column Wraps
Pens and Notepads
Student Competition Fund
Latin American Symposium & Competition
Young Professional Industry Shadowing Program Sponsor of Timothy Reissen

[Image]

Pre-Banquet Social
Plenary Break
Meeting Mobile App
Banquet Tables
Young Professional Industry Shadowing Program Sponsor of Alexandria Watkins
GOLD LEVEL SUPPORTERS

Convention Center Covered Walkway Banner
Meeting Bag Insert
Program Book Back Cover
Banquet Tables
Meeting Mobile App
Young Professional Industry Shadowing Program
Sponsor of Julie Tsecouras

SILVER LEVEL SUPPORTERS

Young Professional Social
Badge Holders
Student Competition Fund
Young Professional Industry Shadowing Program
Sponsor of Timothy McNamara

Young Professionals Dinner
Young Professional Industry Shadowing Program
Sponsor of Johana Medina
SILVER LEVEL SUPPORTERS
(CONTINUED)

UNIVAR

Wednesday Afternoon Break

BRONZE LEVEL SUPPORTERS

B&G CURTIS DYNA-FOG

Young Professional Industry Shadowing Program
Sponsor of Evlyn Pless

Biogents

Young Professional Industry Shadowing Program
Sponsor of Marissa Taylor

Brandenburg

Meeting Mobile App

FMC

Program Book Inside Back Cover
AMCA Sustaining Members

AMCA would like to thank the 2018/2019 sustaining members. A full list of current sustaining members is accessible at:
https://www.mosquito.org/page/sustainmemberlist
<table>
<thead>
<tr>
<th>Exhibitor Directory</th>
<th>Booth No.</th>
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<tbody>
<tr>
<td>A1 Mist Sprayers (A Brand of Valley Industries)</td>
<td>314</td>
</tr>
<tr>
<td>110 W. 3rd Street, Ponca, NE 68770</td>
<td></td>
</tr>
<tr>
<td>Phone: 320-243-8500</td>
<td></td>
</tr>
<tr>
<td>Email: <a href="mailto:info@mistsprayers.com">info@mistsprayers.com</a></td>
<td></td>
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<tr>
<td><a href="http://www.mistsprayers.com">www.mistsprayers.com</a></td>
<td></td>
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<tr>
<td>ADAPCO, LLC</td>
<td>201</td>
</tr>
<tr>
<td>550 Aero Lane, Sanford, FL 32771</td>
<td></td>
</tr>
<tr>
<td>Phone: 800-367-0659</td>
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<tr>
<td>Email: <a href="mailto:info@MyADAPCO.com">info@MyADAPCO.com</a></td>
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<tr>
<td>Airofog USA</td>
<td>115</td>
</tr>
<tr>
<td>15074 Aviation Loop Drive, Brooksville, FL 34604</td>
<td></td>
</tr>
<tr>
<td>Phone: 352-593-5152</td>
<td></td>
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<tr>
<td>Email: <a href="mailto:roy@airofogusa.com">roy@airofogusa.com</a></td>
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<td><a href="http://www.airofogusa.com">www.airofogusa.com</a></td>
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<tr>
<td>AllPro Vector Group</td>
<td>215</td>
</tr>
<tr>
<td>640 Griswold Street, Suite 200, Northville, MI 48167</td>
<td></td>
</tr>
<tr>
<td>Phone: 248-773-7460</td>
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<tr>
<td>Email: <a href="mailto:sales@allprovector.com">sales@allprovector.com</a></td>
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<td><a href="http://www.allprovector.com">www.allprovector.com</a></td>
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<tr>
<td>AMCA Young Professionals</td>
<td>501</td>
</tr>
<tr>
<td>1120 Route 73, Suite 200, Mount Laurel, NJ 08054</td>
<td></td>
</tr>
<tr>
<td>Phone: 856-439-9222</td>
<td></td>
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<tr>
<td>Email: <a href="mailto:amca@mosquito.org">amca@mosquito.org</a></td>
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<tr>
<td><a href="https://amcayps.wordpress.com/">https://amcayps.wordpress.com/</a></td>
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<tr>
<td>American Longray LLC</td>
<td>108</td>
</tr>
<tr>
<td>23287 Foley Street, Unit B, Hayward, CA 94545</td>
<td></td>
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<tr>
<td>Phone: 415-830-9494</td>
<td></td>
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<tr>
<td>Email: <a href="mailto:contact@pestgoaway.com">contact@pestgoaway.com</a></td>
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<td><a href="http://www.pestgoaway.com">www.pestgoaway.com</a></td>
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<tr>
<td>American Mosquito Control Association</td>
<td>521</td>
</tr>
<tr>
<td>1120 Route 73, Suite 200, Mount Laurel, NJ 08054</td>
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<td>Company Name</td>
<td>Page</td>
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<td>--------------------------------------------------</td>
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</tr>
<tr>
<td>AMVAC Environmental Products</td>
<td>211</td>
</tr>
<tr>
<td>5225 Clarendon Hills Drive</td>
<td></td>
</tr>
<tr>
<td>Fort Collins, CO 80526</td>
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<tr>
<td>Phone: 772-205-5280</td>
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<tr>
<td>Email: <a href="mailto:peterc@amvac-chemical.com">peterc@amvac-chemical.com</a></td>
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<td><a href="http://www.amvac-chemical.com">www.amvac-chemical.com</a></td>
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<tr>
<td>Application Dynamics</td>
<td>315</td>
</tr>
<tr>
<td>P.O. Box 152725</td>
<td></td>
</tr>
<tr>
<td>Cape Coral, FL 33915</td>
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</tr>
<tr>
<td>Phone: 239-673-8328</td>
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</tr>
<tr>
<td>Email: <a href="mailto:williams@applicationdynamics.net">williams@applicationdynamics.net</a></td>
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<td>Arkion Life Sciences/Stop the Bites(r) Mosquito</td>
<td>223</td>
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<tr>
<td>and Tick Control/ Flight Control(r) Goose Repellent</td>
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<tr>
<td>551 Mews Drive</td>
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<td>New Castle, DE 19720</td>
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<td>Phone: 302-504-7424</td>
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<td>Email: <a href="mailto:lweaver@arkionls.com">lweaver@arkionls.com</a></td>
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<td><a href="http://www.stopthebitesmc.com">www.stopthebitesmc.com</a> / flightcontrol.com</td>
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<tr>
<td>Atlantic Paste &amp; Glue, Co., INC / Catchmaster</td>
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<td>Bayone, NJ 07002</td>
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<td>Barrie, ON L4N 6C6</td>
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<td>Phone: 919-549-2000</td>
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<td>Email: <a href="mailto:kurt.vandock@Bayer.com">kurt.vandock@Bayer.com</a></td>
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<td>Regensburg, Germany 93055</td>
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<td>Phone: 304-209-6369</td>
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<td>Email: <a href="mailto:scott.gordon@biogents.com">scott.gordon@biogents.com</a></td>
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<td>Rancho Dominguez, CA 90220</td>
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<td>Phone: 310-667-8800</td>
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BRANDENBURG UK
29 Navigation Drive, Hurst Business Park
Brierley Hill, West Midlands DY5 1UT
United Kingdom
Phone: 314-708-9620
Email: marketing@b-one.com
www.b-one.com

Britten-Norman Ltd.
150 Alhambre Circle, Suite #1260
Coral Gable, FL 33134
Phone: 305-967-6978
Email: sales@britten-norman.com
www.britten-norman.com

BVA Inc.
P.O. Box 930301
Wixom, MI 48393
Phone: 248-348-4920
Email: info@bva oils.com
www.bva oils.com

Central Life Sciences
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Phone: 800-877-6374
Email: conrel@central.com
www.centralmosquitocontrol.com

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Canada
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Email: antoine.roy@cfroy.ca
www.cfr-innovations.com

Clarke
675 Sidwell Court
Saint Charles, IL 60174
Phone: 800-323-5727
Email: customercare@clarke.com
www.clarke.com

Control Solutions Inc.
5903 Genoa Red-Bluff Road
Pasadena, TX 77507
Phone: 281-386-1393
Email: tom.algeo@control solutionsinc.com
www.control solutions.com
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<td>135 Region South Drive</td>
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<td>Phone: 678-688-5601</td>
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<td>Digital Map Product</td>
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<td>1200 Intrepid Avenue, Suite 300</td>
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<td>Entomological Society of America</td>
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<tr>
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<tr>
<td>Phone: 740-696-3769</td>
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<td>Phone: 407-986-3351</td>
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<td>Email: <a href="mailto:info@feelgoodinc.org">info@feelgoodinc.org</a></td>
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<td>Phone: 215-299-6000</td>
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<td>Email: <a href="mailto:Brad.chalk@fmc.com">Brad.chalk@fmc.com</a></td>
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Frontier Precision, Inc.
154 1st Avenue W.
Jerome, ID 83338
Phone: 208-324-8006
Email: linda@frontierprecision.com
www.frontierprecision.com/mosquito

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www.leateam.com

Local Arrangements Committee – 2019
Orlando, FL

Local Arrangements Committee – 2020
Portland, OR

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Email: bob@londonfoggers.com
www.londonfoggers.com

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Sanford, FL 32773
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www.mymces.com

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418 Hermitage Road
Castle Hayne, NC 08429
Phone: 910-602-1681
Email: shelly.sordellini@mirimichigreen.com
www.mirimichigreen.com
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<td>Reneotech Inc. DBA EcoRaider</td>
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<td>S.C. Johnson &amp; Son Inc.</td>
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**Nixalite of America, Inc.**
1025 16th Avenue
East Moline, IL 61244
Phone: 800-624-1189
Email: sales@nixalite.com
www.nixalite.com

**Pro-Lab Diagnostics**
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**Reneotech Inc. DBA EcoRaider**
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www.Ecoraiderusa.com

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www.scjohnson.com

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**STUCK®**
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Email: info@summitchemical.com
www.summitchemical.com
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Santa Fe Springs, CA 90670
Phone: 800-352-3870
Email: susana.norris@target-specialty.com
www.target-specialty.com

TickKey International, Inc.
PO Box 437
Goshen, CT 06756
Phone: 860-618-3073
Email: sales@tickkey.com
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Email: andrew.assir@univar.com
www.pestweb.com

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Email: info@valentbiosciences.com
www.valentbiosciences.com

VectorBase
University of Notre Dame
315 Galvin Life Science Center
Notre Dame, IN 46556
Phone: 574-631-8045
E-mail: merz.3@nd.edu
www.vectorbase.org
General Information

Registration and Internet Hub Hours
Located in the Grand Sierra Foyer

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<th>Hours</th>
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<tr>
<td>Monday, Feb 25</td>
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<td>Tuesday, Feb 26</td>
<td>7:00 am – 5:30 pm</td>
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<td>Wednesday, Feb 27</td>
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<td>Thursday, Feb 28</td>
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<td>Friday, Mar 1</td>
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Speaker Ready Room Hours
Located in Bonaire 5

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<td>Friday, Mar 1</td>
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Exhibit Hall Hours
Located in Grand Sierra D-I

Set-up:
Monday, Feb 25 8:00 am – 3:00 pm

Viewing Hours:
Monday, Feb 25 5:00 pm – 8:00 pm
Tuesday, Feb 26 12:00 pm – 1:45 pm
                      3:15 pm – 4:00 pm
Wednesday, Feb 27 10:00 am – 10:45 am
                      12:15 pm – 4:00 pm
Thursday, Feb 28 8:30 am – 10:45 am

Breakdown:
Thursday, Feb 28 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, February 27 from 12:15 pm – 1:45 pm.

Poster Set-up:
Monday, Feb 25 2:00 pm – 4:00 pm

Poster Removal:
Thursday, Feb 28 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
Education Day is on Tuesday, February 26 from 10:00 am to noon. AMCA volunteers will provide educational programs to visitors at The Montessori World School. Activities include presentations related to mosquitoes and mosquito control, and students will have the opportunity to have hands-on experiences with various mosquito and mosquito control related items. For information, please see the AMCA registration counter.

Field Day
Field Day is taking place on Thursday, February 28 from 1:30 – 4:00 pm onsite at the Caribe Royale Convention Center. It will feature exhibits from mosquito control districts, government, and non-profit organizations in the pavilion and overflow lot. Industry experts will demonstrate the latest technology in equipment, methodology, mosquito surveillance, and lab testing for mosquito-borne diseases. There will also be a series of short educational presentations throughout the event.

Internet Hub
The Internet Hub is located in the Grand Sierra Foyer. Complimentary computer stations with internet/email access and word processing are provided. Use of these computers is limited to 15 minutes. These stations are not intended for editing or printing long documents. Please use the hotel business center for these purposes.

Latin American Symposium
The 29th Annual Latin American Symposium, held all day Wednesday, 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 Tuesday and Wednesday lunches will be served in the Exhibit Hall. The banquet on Thursday is a full dinner. No breakfasts are served at the 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 Thursday from 10:45 am – 12:00 pm in Antigua 1. 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 audiovisual aids, timers, and lighting with the projectionist. 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. Individual function tickets are also required for receptions and the banquet.

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 West Lobby of the Caribe Royale Convention Center on Wednesday. Please see your tour ticket and registrations for more information.

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 501 located in the Exhibit Hall.
Young Professionals Welcome Dinner
This YP-only event is sponsored by TERMINIX and requires a ticket for entry, as space is limited. Visit the YP booth to pick up your ticket (if you’ve RSVP’ed) or to inquire about availability.

Young Professionals Career Round-Table Symposium will be held on Wednesday, February 28 from 1:45 pm - 5:30 pm in the Grand Sierra C meeting room. The symposium will include a brief meeting followed by round-table career discussions with field experts. Check program for more symposium details.

Young Professionals Social will be held on Wednesday, February 28 from 5:30 pm to 6:30 pm in the Grand Sierra B meeting room. The event will include a one-hour open bar social and light hors d’oeuvres. The event is sponsored by AMVAC. Check program for more details.

Young Professionals Promo Booth will be hosted in the Exhibit Hall at Booth 501. Come see us during breaks for free games, prizes, and group information.

Download the 2019 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 ‘CrowdCompass AttendeeHub’. 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 AttendeeHub app and enter AMCA 2019 in the search bar. Tap the name of your event, then tap Download to open it.

Or visit https://event.crowdcompass.com/2019amca
AMCA RESEARCH FUND

2018 Research Fund Awardees
Dana Price, PhD, “Assessing the arboviral landscape via metagenomic analyses of sentinel FTA cards”, Rutgers, The State University of New Jersey.

2019 Research Fund Awardees
Nathan Burkett-Cadena, PhD, “Automated real-time collection and high-fidelity identification of vectors”, University of Florida.
Brian Byrd, PhD, “Rapid identification and characterization techniques for mosquitoes of public health importance”, Western Carolina 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 payable to:
AMCA Research Fund
ATTN: Heather Gosciniak
1120 Route 73, Ste. 200
Mount Laurel, NJ 08054

AMCA would like to thank the following contributors (since February 23, 2018):
ADAPCO
Anonymous Contribution
Canyon County Mosquito Abatement 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
<table>
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<th>Time</th>
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| 9:00 AM – 3:00 PM | Pre-Conference Workshop: Learn the CDC Bottle Bioassay  
Janet McAllister  
Hibiscus Room  
(Pre-registration is required) |
| 1:00 PM – 5:00 PM | AMCA Committee Meetings  
1:00 PM – 2:00 PM | Public Relations  
Bonaire 1  
Legislative & Regulatory  
Bonaire 2  
Bylaws & Policy  
Bonaire 3  
GIS Subcommittee  
Bonaire 4  
2:00 PM – 3:00 PM | Finance  
Bonaire 1  
Legislative & Regulatory  
Bonaire 2  
JAMCA Editorial Board  
Bonaire 3  
3:00 PM – 4:00 PM | Training & Member Education  
Bonaire 1  
Science & Technology  
Bonaire 2  
Publications  
Bonaire 3  
Membership  
Bonaire 4  
4:00 PM – 5:00 PM | PESP Subcommittee  
Bonaire 1  
Science & Technology  
Bonaire 2  
2:00 PM – 4:00 PM | Poster Set-Up  
Exhibit Hall  
5:00 PM – 8:00 PM | Grand Opening of the Exhibit Hall and Welcome Reception  
Exhibit Hall–Grand Sierra D-I  
(Badge Required for Entry)  
Welcome Reception is sponsored by Central Life Sciences |
Tuesday, February 26, 2019

8:00 AM – 12:00 PM  PLENARY SESSION

Organizer/Moderator:  Ary Faraji, PhD
8:00 AM – 12:00 PM
Meeting Room:  Grand Sierra A-C

8:00  Call to Order
     Bill Walton, PhD, AMCA President

8:05  Welcome to Orlando
     Tanya Peak Smith, Director of Pest
          Management Global Initiatives, Walt
          Disney Co.

8:10  Program Announcements
     Ary Faraji, PhD, AMCA Vice
          President/Program Chair

8:15  Presidential Address
     Bill Walton, PhD

8:35  Awards Presentation
     Bill Walton, PhD

9:05  AMCA Memorial Lecture
     Honoree:  William Opp
     Lecturer:  Dr. Gordon Patterson

10:00 Break—Sponsored by ADAPCO

10:30  PL-1  The use of Wolbachia to disrupt
dengue, Zika, and chikungunya
transmission by Aedes aegypti
     Peter Ryan

11:15  PL-2  Frugal science: from toys to global
innovations
     Manu Prakash

President’s Luncheon and
Exhibits Open
12:00 PM - 1:45 PM
Exhibit Hall – Grand Sierra D-I
**Afternoon Sessions**

*unless otherwise noted

### Adult Control I

**Moderator:** Samer Elkashef  
**1:45 PM - 3:15 PM**  
**Meeting Room:** Curacao 5

1:45  1 Promising new tools to fight *Aedes* mosquitoes in Thailand  
*Alongkot Ponlawat,* Thanyalak Fansiri, Arissara Pongsiri, Wachiraphan Chittham, Silas A. Davidson, Robert L. Aldridge, Seth C. Britch, Kenneth J. Linthicum

1:55  2 Improved algorithms behind VectorWEB and pending deployment  
*Laura Scavo,* Adam Goodwin, Margaret Glancey, Tristan Ford, Jewell Brey, Collyn Heier, Soumyadippta Acharya

2:05  3 Transfluthrin on US military materials reduces mosquito populations in a hot humid tropical environment in eastern Thailand  
*Seth Carroll Britch,* Kenneth J. Linthicum, Alongkot Ponlawat, Daniel L. Kline, Wendy L. Helmey, Arissara Pongsiri, Robert L. Aldridge, Frances V. Golden

2:15  4 Protocol for field and laboratory evaluating acute toxicity of aerial naled on *Danaus plexippus* (monarch butterflies) and *Aedes taeniorhynchus* (black salt marsh mosquitoes)  
*John P. Smith,* Taylor J. Taylor, Cami I. Adams, Karen Fleming

2:25  5 Insecticide resistance trials in North Chicago suburbs  
*Patrick M. Irwin,* Mark Clifton, Justin Harbison, Chris Xamplas

2:35  6 Adult mosquito control treatments exert temporary reductions in mosquito abundance but long-lasting effects on the population dynamics of urban *Culex pipiens* mosquitoes  
*Mark Clifton,* Chris Xamplas, Justin Harbison
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Presenters</th>
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<tbody>
<tr>
<td>2:45</td>
<td>Comparing and contrasting deltamethrin formulations: implications for</td>
<td>Samer Elkashe, Sarah S. Wheeler, Marcia Reed, Steve Ramos</td>
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<td>resistance management</td>
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<td>2:55</td>
<td>Long-lasting spatial repellents: isovalerate esters of monoterpenoids</td>
<td>Joel R. Coats, James S. Klimavicz, Edmund J. Norris, Caleb Lee Corona</td>
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<tr>
<td>3:05</td>
<td>Advancing insecticide application technology to protect populations in</td>
<td>Jason Richardson, Nick Hamon, Julian Entwistle, Clint Hoffmann</td>
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<td>low- and middle-income countries from malaria and arboviral diseases</td>
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<td></td>
<td><strong>Mosquito Lightning Symposium</strong></td>
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<td></td>
<td><strong>Organizer/Moderator:</strong> Ary Faraji</td>
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<td><strong>Meeting Room:</strong> Antigua 1</td>
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<tr>
<td>1:45</td>
<td>Love to hate you! The world's weirdest mosquito species!</td>
<td>Ary Faraji, Stephen Doggett, Christina Liew</td>
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<tr>
<td>1:49</td>
<td>Mosquito revelations</td>
<td>Nathan Burkett-Cadena</td>
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<td>1:53</td>
<td>Everybody loves the zoo, even the mosquitoes</td>
<td>Lee Cohnstaedt</td>
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<td>1:57</td>
<td>Transfluthrin on US military materials reduces mosquito and sand fly</td>
<td>Seth Carroll Britch, Alexandra Chaskopoulou, Kenneth J. Linthicum, Wendy</td>
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<td>populations in a warm temperate Mediterranean environment in Greece</td>
<td>L. Helmey, Daniel L. Kline, Frances V. Golden, Robert L. Aldridge, Ioannis</td>
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<td>A. Giantsis, Michail Miaoulis</td>
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<td>2:01</td>
<td>A mosquito toilet to optimize arbovirus surveillance</td>
<td>Scott Ritchie, Dagmar Meyer</td>
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<td>2:05</td>
<td>Innovation in vector control from IVCC and its partners</td>
<td>Jason Richardson, Nick Hamon</td>
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<tr>
<td>2:09</td>
<td>16</td>
<td>Role of Harris County Public Health mosquito control in community education and outreach</td>
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<td>2:13</td>
<td>17</td>
<td>Anatomy of a molecular arbovirus detection lab</td>
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<td>2:17</td>
<td>18</td>
<td>The influence of mosquito larvae on structure and function of food webs across a nutrient gradient</td>
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<td>2:21</td>
<td>19</td>
<td>If you can’t beat ‘em, blow ‘em up! Mosquito control with larvicide mortar shells</td>
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<td>2:25</td>
<td>20</td>
<td>Natural T30 for mosquito control: two sides of the same coin</td>
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<td>2:29</td>
<td>21</td>
<td>The importance of connection - government organizations and private companies working together in the mosquito control industry</td>
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<td>2:33</td>
<td>22</td>
<td>What constitutes a good trap?</td>
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<td>2:37</td>
<td>23</td>
<td>Effects of vaporized organophosphates (Dibrom and Fyfanon) on adult mosquitoes</td>
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<td>2:41</td>
<td>24</td>
<td>Who owns the night?… aerial spraying after dark to control mosquitoes and midges</td>
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<td>2:45</td>
<td>25</td>
<td>How does age and strain of colony mosquitoes influence susceptibility to pyrethroids?</td>
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<td>2:49</td>
<td>26</td>
<td>Residentially linked La Crosse encephalitis cases suggest need for improved environmental assessments and mosquito control</td>
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<td>2:53</td>
<td>27</td>
<td>New ideas often come from unexpected places</td>
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### Student Paper Competition I

**Moderator:** Brian Byrd  
1:45 PM - 3:15 PM  
**Meeting Room:** Curacao 1

<table>
<thead>
<tr>
<th>Time</th>
<th>Number</th>
<th>Title</th>
<th>Authors/Presenters</th>
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<tbody>
<tr>
<td>1:45</td>
<td>30</td>
<td>The 30th Annual Student Paper Competition of the American Mosquito Control Association</td>
<td>Brian Byrd</td>
</tr>
<tr>
<td>1:50</td>
<td>31</td>
<td>Death by cattle: zooprophylaxis and eprinomectin endectocide efficacy in the management of malaria mosquitoes (Anopheles quadrimaculatus)</td>
<td>Annie Elizabeth Rich, Nancy C. Hinkle, Seth Irish, T. Dean Pringle</td>
</tr>
<tr>
<td>2:00</td>
<td>32</td>
<td>Efficacy of ground ULV adulticide application on West Nile Virus vectors in the Chicago suburbs</td>
<td>Kristina Lopez, Patrick M. Irwin, Susan Paskewitz, Lyric Bartholomay</td>
</tr>
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<td>2:10</td>
<td>33</td>
<td>Is there insecticide resistance in biting midges?</td>
<td>Thomas Jay Hempy</td>
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<tr>
<td>2:20</td>
<td>34</td>
<td>Select biodegradable nanoparticles localize internally within <em>Aedes aegypti</em> mosquitoes and may represent a new means to deliver insecticides</td>
<td>Edmund J. Norris, Adam Mullis, Yashdeep Phanse, Balaji Narasimhan, Lyric Bartholomay, Joel R. Coats</td>
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<tr>
<td>2:30</td>
<td>35</td>
<td>Using biorational products as spatial repellents against mosquitoes of multiple genera</td>
<td>Caleb Lee Corona, James S. Klimavicz, Edmund J. Norris, Joel R. Coats</td>
</tr>
</tbody>
</table>
A comparison of the efficacy of infusion water for the attraction of gravid Culex mosquitoes using locally collected Silver Maple leaves vs. purchased Alfalfa pellets and pasteurized chicken manure. **Katherine Bowman, Trey Hull, Cameron Harvey**

Effects of diet and sex on thermal tolerance of *Aedes aegypti* and *Culex quinquefasciatus* **Madeleine Chura, Kristen Healy**

Introducing midgut microbes to mosquitoes: the effects of native and non-native strains of bacteria **Fior Alicia Martinez, Erin Schuenzel, Grant Hughes, Christopher Vitek**

**Post Regulatory Approval SIT Adoption Symposium**
Moderator: **Ralph Breslauer**
1:45 PM - 3:15 PM
*Meeting Room: Bonaire 1*

Automation for large scale SIT deployment **Ralph Breslauer**

A Wolbachia-based autocidal approach to control *Aedes* mosquitoes **Jimmy Mains**

Oxitec’s 2nd generation self-limiting mosquitoes **Kevin Gorman**

The path to widescale releases of Wolbachia-infected male mosquitoes **Jodi Holeman**

**3:15 PM – 4:00 PM** **ICE CREAM SOCIAL**
*Grand Sierra Ballroom*
(Badge Required for Entry, Ticket Required for Service)

*Ice Cream Social is sponsored by Valent BioSciences*
Tuesday, February 26, 2019

4:00 PM – 5:30 PM*  AFTERNOON SESSIONS
*unless otherwise noted

6th Arthropod Vector Highlights Symposium
Organizer/Moderator: Lee Cohnstaedt
4:00 PM - 5:30 PM
Meeting Room: Antigua 1

4:00  39  Highlights of vector biology
       Roxanne Connelly

4:30  40  Highlights of vector control
       Christopher Stephen Bibbs

5:00  41  Highlights from Latin America
       Catalina Alfonso

Adult Control II
Moderator: Wesley Clint Hoffmann
4:00 PM - 5:30 PM
Meeting Room: Curacao 5

4:00  42  Integrating space sprays into existing malaria control programs
       Wesley Clint Hoffmann, Daniel McDermott, Jason Richardson, Graham Small, Julian Entwistle

4:10  43  Volcano to vector control: It’s time for nature to fight back...

4:20  44  Effects of plant substrate, insecticide, and physiological state on the efficacy of barrier treatments against Aedes albopictus
       Benjamin E. McMillan Brandi L. Benedict, Carlyle C. Brewster, Nicola T. Gallagher, Sally L. Paulson
Impact of radiation on *Wolbachia*-treated *Aedes aegypti*

**Robert L. Aldridge**, Seth C. Britch, Daniel A. Hahn, Dylan Tussey, Chao Chen, Tatiana L. Gerena, Jedidiah Kline, Kenneth J. Linthicum

Determination of pyrethroid and organophosphate susceptibility in *Aedes aegypti* (Diptera: Culicidae) from Yuma County, AZ

**Christy Marie Waits**, Alden S. Estep, Chris Sumner, Elene Stefanakos, James J. Becnel

Automatic identification of the species and sex of captured mosquitoes in an advanced, remotely operated mosquito trapping system: technical background and results from the laboratory and field

**Michael Weber**, Martin Geier, Andreas Rose, Sergej Sperling, Ilyas Potamitis

Estimating the efficacy of aerial spraying on reducing the relative abundance of *Culex tarsalis* and *Culex pipiens*: a model-based approach

**Karen Holcomb**, Robert Reiner, Christopher Barker

Effect of passive metofluthrin emanators on landing and mortality of pyrethroid-resistant *Aedes aegypti*

**Mike W. Dunbar**, Gregor J. Devine, Pablo Manrique-Saide, José Vadillo-Sanchez, Evaristo Morales Rios, Wilberth Bibiano-Marín, Anuar Medina-Barreiro, Gonzalo Vázquez-Prokopec

Indoor residual spraying for *Aedes aegypti* control in the Dominican Republic: challenges and lessons learned

**Patricio Murgueytio**, Ingrid Marbella Miranda, Gavino Guzman, Griselda Herrera, Nelson Grisales, Mauricio Otalora, Candida Melendez, Angel Solis
**Tuesday, February 26, 2019**

**Management**

**Moderator:** Anita Schiller  
**Meeting Room:** Bonaire 1  
4:00 PM - 5:30 PM

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<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Speaker(s)</th>
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<tbody>
<tr>
<td>4:00</td>
<td>Making vector control sustainable</td>
<td>Manuel F. LLuberias</td>
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<td>4:10</td>
<td>Building capacity in local vector control programs</td>
<td>Chelsea Gridley-Smith, Grace McClain, Oscar Alleyne</td>
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<td>4:20</td>
<td>Post Hurricane Harvey - rebirth of a rebel-rousing program</td>
<td>Anita Schiller</td>
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<td>4:30</td>
<td>Attract, trap, and train your mosquito control dream team</td>
<td>Chelsea Gridley-Smith</td>
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<td>4:40</td>
<td>Mobile technology applications for entomological surveillance and vector</td>
<td>Ingrid Marbella Miranda, Martin Ismael Batista, Watson Luis Rodriguez, Quang Truong, Matthew Boddie, Jillian Berkowitz, Gavino Guzman, Griselda Herrera, Grey Benoit, Juan Leonidas Castro</td>
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<td>4:50</td>
<td>Linking science and policy with practice: a mosquito control example</td>
<td>Patricia Dale, Jon Knight</td>
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<td>5:00</td>
<td>Towards a new global framework for advancing vector control innovations to</td>
<td>Grey Frandsen, Michael Jooste</td>
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<td>5:10</td>
<td>Florida Mosquito Control Association’s premier training event, The Dodd Short</td>
<td>Aaron Lloyd, Eric Jackson, Wade Brennan</td>
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<td>5:20</td>
<td>Survey of regional capacity for vector control by the Midwest Center of</td>
<td>Trisha R. Dubie, Edward Walker</td>
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<td>Excellence for Vector-Borne Disease</td>
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<td>4:00</td>
<td>60</td>
<td>Identifying localized predictors of Aedes vectors of La Crosse virus in a hot spot (Knox County, Tennessee)</td>
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<td>4:10</td>
<td>61</td>
<td>Presence of Jamestown Canyon Virus in White-Tailed Deer (Odocoileus virginianus) of the Florida Parishes in Louisiana</td>
</tr>
<tr>
<td>4:20</td>
<td>62</td>
<td>Pyrethroid resistance influences susceptibility to infection of Aedes aegypti with Zika virus</td>
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<td>4:30</td>
<td>63</td>
<td>Rickettsia Diversity of Amblyomma americanum in Florida</td>
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<td>4:40</td>
<td>64</td>
<td>The ecology of dog heartworm disease</td>
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<td>4:50</td>
<td>65</td>
<td>The extrinsic incubation of Zika virus in New Orleans Aedes aegypti and Ae. albopictus mosquitoes</td>
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<td>5:00</td>
<td>66</td>
<td>Vector-borne and zoonotic diseases: consideration given by local healthcare providers during initial diagnosis</td>
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Tuesday, February 26, 2019

5:10   67   Invasive Mosquito Project: raising Scientific and Environmental Awareness in the Community through Citizen Science
         Julie Tsecouras, William Walton, Lee Cohnstaedt

5:20   68   Ir8a mutant mosquitoes lose strong attraction to human odor
         Joshua Ibukun Raji, Nadia Melo, Sheyla Gonzalez, Valeria Saldana, John Castillo, Marcus Stensmyr, Matthew DeGennaro

Trustee/Commissioner Session
Organizer/Moderator: Douglas Carlson
4:00 PM - 5:30 PM
Meeting Room: Grand Sierra C

4:00   69   Importance of mosquito control to the development of the Kennedy Space Center
         Gordon M. Patterson

4:45   70   Overview of impoundments along the Indian River Lagoon and management at the Merritt Island & Pelican Island National Wildlife Refuges
         Douglas Carlson

5:45 PM – 7:15 PM   LATIN AMERICAN DISCUSSION
                     Grand Sierra C
8:30 AM – 5:00 PM  TRUSTEE/COMMISSIONER TOUR
Off-site Event: Merritt Island National Wildlife Refuge & Kennedy Space Center
Ticket Required

8:30 AM – 10:00 AM* MORNING SESSIONS
*unless otherwise noted

Latin American Student Competition
Moderator: Lee Cohnstaedt
8:30 AM - 10:00 AM
Meeting Room: Antigua 1

8:30  71 DNA Barcodes and Evidence of Cryptic Diversity of Anthropophagous Mosquitoes in Quintana Roo, Mexico
Rahuel Jeremías Chan-Chable, Arely Martínez Arce, Pedro Christian Mis Avila, Aldo Ivan Ortega Morales, Rafael Vazquez Marroquin

8:40  72 Evaluation of different trap configurations for collection of Lutzomyia sand flies naturally infected with Leishmania and Bartonella in Peru
Victor Osiel Zorrilla, Marisa Lozano, Liz Espada, Michael Kosoy, Clifton McKee, Lynn Osikowicz, Heriberto Arévalo, Mario Troyes, Craig Stoops Michael Fisher, Gissella M. Vásquez

8:50  73 Repellent effect of terpenes against Aedes aegypti (Diptera: Culicidae): in silico simulations with Odorant Binding Protein AaegOBP1
Johan Sebastián Portilla, Ruth Mariela Castillo, Stelia Carolina Méndez, Jonny Edward Duque

9:00  74 microRNAs from Insecta organisms conserved de novo in Aedes aegypti
Daniel Rafael Saldaña-Torres, Chen-Yu Zhang, Gustavo Ponce-Garcia, Adriana E. Flores-Suarez, Iram Pablo Rodríguez-Sanchez
### Wednesday, February 27, 2019

<table>
<thead>
<tr>
<th>Time</th>
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| 9:10 | 75 Role of human genomics in presenting symptomatology of Chikungunya infection  
Martha Patricia Lopez, Karina Trujillo, Ivan A. Marino, Gerardo De Jesus Trujillo, Gustavo Ponce-Garcia, Iram Pablo Rodriguez-Sanchez |
| 9:20 | 76 Distribution and frequency of the kdr mutation, V410L in 28 natural populations of *Aedes aegypti* from Mexico  
Kevin Aaron Ontiveros-Zapata, Olga Karina Villanueva-Segura, Gustavo Ponce-Garcia, Beatriz Lopez-Monroy, Selene Marlen Gutierrez-Rodríguez, Adriana E. Flores-Suarez |
| 9:30 | 77 Simultaneous detection of kdr mutations, V1016I/F1534C in populations of *Aedes aegypti* from Mexico resistant to pyrethroids  
| 9:40 | 78 Mitochondrial respiratory parameters in *Aedes aegypti* (Diptera:Culicidae) larvae  
Diana Lizeth Urbina, Ruth Mariela Castillo, Stelia Mendez, Jonny Duque |
| 9:50 | 79 Morphometric variations on populations of *An. darlingi* and *An. albitalarsis F* (Diptera: Culicidae) in Colombia  
Miguel Alfonso Pacheco, Helena L. Brochero, Ranulfo González |
Legislative and Regulatory Symposium
Organizer/Moderator: Angela Beehler
8:30 AM - 10:00 AM
Meeting Room: Bonaire 1

8:30 80 Coordination among public health organizations
Angela Beehler

8:40 81 Update on legislation impacting mosquito control operations
Gary Goodman

9:00 82 USFWS releases new “Handbook for Mosquito Management on National Wildlife Refuges”
William Howard Meredith

9:15 83 2019 AMCA Washington Conference
T. Wayne Gale

9:25 84 Emergency preparedness: a plan created by the Pesticide Program Dialogue Committee Public Health Work Group
Susan Jennings

9:40 85 Incorporating usage data to identify areas where pesticide exposure to listed species is most likely to occur
Melissa Panger

Student Paper Competition III
Organizer/Moderator: Brian Byrd
8:30 AM - 10:00 AM
Meeting Room: Curacao 1

8:30 86 Mirnomics on differentes approaches in *Aedes aegypti*
Iram Pablo-Rodriguez, Daniel Rafael Saldaña-Torres, Adriana E. Flores-Suarez, Gustavo Ponce-Garcia, Laura E. Martinez-de-Villarreal, Chen-Yu Zhang

8:40 87 Population and landscape genetics of *Aedes aegypti* in eastern Florida, USA
Evelyn Pless, Giuseppe Amatulli, Kristen Hopperstad, Jeffrey Powell
Fine-scale ecological niche modeling of Aedes aegypti and Aedes albopictus mosquitoes in eastern Florida, USA
Kristen Hopperstad, Mohamed Sallam, Michael Reiskind

Likelihood of overcompensation for Aedes in the field
Katherine Evans, Steven A. Juliano

From spatial repellent to harborage treatment adulticide: pilot tests of metofluthrin for point-source mosquito abatement.
Christopher Bibbs, Phil Kaufman, Rui-De Xue

DIY Mosquito Trap For Catching Gravid Aedes Mosquitoes Using a Recycled Two Liter plastic Bottle
Laura Scavo, Sophie Soltanian, Margaret Glancey, Adam Goodwin, Tristan Ford, Soumyadipta Acharya

Molecular Barcoding and Niche Modeling Analysis of Horse Flies in the Southeastern United States
Travis Mitchell Davis, Daniel L. Kline Bradley Mullens, Monica Papes, John Kevin Moulton, Rebecca Trout Fryxell

Breeding ground: ovicup trapping in Lexington, KY
Christopher William Kositzke, Caitlin Stamper, Stephen L. Dobson

Mating acoustic behavior of the malaria vector Anopheles albimanus
Hoover Esteban Pantoja, Sebastian Gomez, Viviana Velez, Fredy Ruiz Frank Avila. Catalina Alfonso
Worldwide Management of *Aedes aegypti* and *Aedes albopictus* Symposium I

**Moderator:** Rui-De Xue and Tong-Yan Zhao  
**Meeting Room:** Curacao 5  

8:30  95 Resurgence of *Aedes aegypti* and its control efforts at the Anastasia Mosquito Control District, northeastern Florida  
*Rui-De Xue*

8:40  96 Study of invading *Aedes aegypti* of Yunnan Province in China  
*Tongyan Zhao*

9:00  97 Study of *Aedes* surveillance, early-warning and management in China  
*Qiyong Liu*

9:20  98 Toward a global partnership for the control of insecticide resistant arbovirus vectors: the WIN initiative  
*Vincent Corbel*, Jean Phillippe David, Claire Durot

9:40  99 *Aedes albopictus*: the history of an invasion  
*Gordon M. Patterson*

9:50 100 History of urban-*Aedes* surveillance in Texas: past, present, and future  
*Whitney Qualls*, Bethany Bolling

UAS in Mosquito Surveillance and Control Symposium

**Organizer/Moderator:** Joel Buettner  
**Meeting Room:** Grand Sierra C  

8:30  272 Drone spraying operations & the Federal Aviation Regulations  
*Jonathan Rupprecht*

8:45  273 Certification process for conducting aerial agricultural operations via small unmanned aircraft systems (sUAS) in Placer County  
*Scott Schon*, Everardo Ortiz Rodriguez
<table>
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<th>Time</th>
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| 8:55  | **Bravo! The flight of the unmanned aircraft: setting up an unmanned aerial program in congested Bravo airspace and an update on custom application equipment for an MG1S drone**  
Bradley Sorenson, Andrew Dewsnup, Gregory White, Ary Faraji |
| 9:05  | **The use of UAS operationally in 2018 for aerial applications in multiple markets**  
Bill Reynolds |
| 9:15  | **Operational savings with UAS larvicide spray technologies**  
Marty Scholl |
| 9:25  | **Fog from the clouds: a new ultra-low volume applicator for UAS adulticide missions**  
Gregory M. Williams, Randy Gaugler |
| 9:35  | **Assessing mosquito breeding sites and abundance from above**  
Eric Haas-Stapleton, Ryan Clausnitzer |
| 9:45  | **Moderated panel discussion and Q & A** |

**10:00 AM - 10:45 AM  **  
**BREAK, EXHIBITS OPEN**  
*unless otherwise noted*  
**MORNING SESSIONS**  
Grand Sierra Ballroom D-I  
Break sponsored by Valent BioSciences

**Adult Control III/Disease/Vector Studies I**  
Moderator: Mark Latham  
10:45 AM – 12:15 PM  
Meeting Room: Curacao 1

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| 10:45 | **Insecticide resistance in *Aedes aegypti* and *Aedes albopictus* mosquitoes along the TX/MX border**  
Heather Hernandez, Christopher Vitek |
Assessing citywide control of *Aedes aegypti* and Zika, chikungunya, and dengue virus transmission by integrating community outreach, education, source reduction, larviciding, and mass trapping

Roberto Barrera, Angela Harris, Ryan R. Hemme, Gilberto E. Felix, Nicole Nazario, Damaris Rodriguez, Julieanne Miranda, Eunice Soto, Stephanie Martinez, Kyle Ryff, Carmen Perez, Veronica Acevedo, Jorge L. Munoz, Manuel Amador, Steven Waterman

A comparison of lambda-cyhalothrin and deltamethrin barrier treatments against *Aedes albopictus* in Mercer County, NJ

Nicholas Indelicato, Isik Unlu

New developments in the use of the sterile insect technique (SIT) against mosquitoes

Jérémy Bouyer, Hamidou Maiga, Hanano Yamada, Wadaka Mamai, Nicole Culbert, Antonios Avgoustinos, Danilo Oliveira Carvalho, Rafael Argiles Herrero, Costas Bourtzis, Marc Vreysen

Development of attract and kill systems for mosquitoes using readily available materials

Jerome Hogsette, Daniel L. Kline

Investigation on possible influence of drought on mosquito population

Hadis Hosseinzadehnaseri, Erin Plaisance, Eleanor Kirkscey

Comparison of Vector Test to RT-PCR during a rampant West Nile virus year in Suffolk, VA

Jay P. Kiser, Karen I. Akaratovic, Charles Felipe Abadam
### Resurgence of St. Louis encephalitis virus in Tennessee

**Abelardo C. Moncayo**, Thomas C. Moore, Nathen E. Bopp, Patricia V. Aguilar, Mayme Van Meveren, Kelly Orejuela, Rebecca Trout Fryxell, Graham Hickling, John Dunn

### Modeling environment-vector interactions to predict disease vulnerability

**Margaret MacDonell**, Jessica Trail, E. Zvolanek, Charles Macal

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### Beekeepers and Mosquito Control: Building A Bridge Symposium I

**Moderator: Frank Wong**

10:45 AM - 12:15 PM

**Meeting Room: Bonaire 1**

10:45 110  Are honey bees really dying?  
**Jamie Ellis**

11:05 111  Fostering relationships between mosquito control and beekeepers  
**Caitlin Gill**

11:15 112  Factors affecting insecticide sensitivity in the honey bee  
**Frank David Rinkevich**

11:30 113  The rusty-patched bumble bee is now endangered: implications for mosquito control districts  
**Mark Clifton**

11:40 114  Mosquito control professionals and beekeepers – we’re more alike than you might think  
**Michael Hudon**

11:50 115  Optimizing communication between applicators and beekeepers to protect pollinators: lessons learned from the FieldWatch collaboration  
**Bob Walters, Stephanie Regagnon**
Worldwide Management of *Aedes aegypti* and *Aedes albopictus* Symposium II

**Moderators:** Rui-De Xue and Tong-Yan Zhao

10:45 AM - 12:15 PM

**Meeting Room:** Curacao 5

10:45 116 Barrier treatments with lambda-cyhalothrin are effective for *Aedes albopictus* management

*Isik Unlu*, Gregory M. Williams, Ilia Rochlin, Yi Wang, Randy Gaugler

10:55 117 Debug Fresno round two: implementing large-scale SIT/IIT in residential neighborhoods

**F. Steve Mulligan**

11:05 118 Efficacy of aerially-applied adulticides and larvicides for the area-wide control of *Aedes aegypti* and *Ae. albopictus* populations in Florida

**Christopher Lesser**

11:25 119 Large-scale field evaluation of the In2Care mosquito trap against *Aedes aegypti* mosquitoes in Manatee County, FL

*Eva Buckner,* Katie Williams, Christopher Lesser, Mark Latham

11:35 120 The mass deployment of autocidal gravid oitraps for the control of *Aedes aegypti* and *Aedes albopictus* in St. Johns County

*Daniel Dixon,* Lagan Mullin, Dena Autry, Kay Gaines, Michael Banfield, Rudy Xue

11:45 121 Review of recent, autocidal mosquito introductions in the USA, with a focus on *Wolbachia* and ADAM approaches

**Stephen L. Dobson**
11:55 122 Sugar feeding behavior of *Aedes aegypti* and *Ae. albopictus* and control with attractive toxic sugar baits (ATSB) in Mali and Florida

_Gunter C. Muller, E. Revay, M. Traore Sekou, F. Traore, Vasiliy, D. Kravchenko, John C. Beier, Rui-De Xue_

12:05 123 What role can spatial repellents play in the management of peridomestic mosquitoes?

_Daniel L. Kline_

**Latin American Symposium I**

*Moderator: Lee Cohnstaedt*

10:45 AM - 12:25 PM

*Meeting Room: Antigua 1*

10:45 124 Barcoding of mosquitoes from communities close to the Mexican Lacandone Jungle: a study to support incrimination of arboviruses on vectors

_Aldo Ortega, Alfonso Garza, Luis Hernández, Quetzaly Siller, Vicente González, Mario Rodríguez_

10:57 125 Epidemiological importance of *Aedes albopictus* in Medellín, Colombia

_Guillermo L. Rua-Uribe, Raul A. Rojo, Enrique A. Henao, Jualiana Perez-Perez_

11:09 126 Potential vectors of dengue, Zika and chikungunya in two municipalities of Cundinamarca Department, Colombia

_Juan Sebastian Mantilla Granados, Myriam Lucia Velandia-Romero, Carolina Coronel-Ruiz, Maria Angélica Calderón-Peláez, Laura Cabezas, Jaime E. Castellanos, Victor Alberto Olano_

11:21 127 Is *Anopheles (Nyssorhynchus) albitalensis* F the only species of the Albitarsis Complex present in Venezuela?

_Miguel Angel Zúñiga, Helena L. Brochero, Yasmin Rubio-Palis_
Automatic and high accuracy identification of *Aedes aegypti* and *Aedes albopictus* larva based on deep neural networks

**Antonio Arista-Jalife**, Mariko Nakano, Hector Perez-Meana, Daniel Robles-Camarillo

Exon conservation and knockdown resistance mutations in the voltage-sensitive sodium channel in *Aedes aegypti*

**Juan Jose Silva**, Jeffrey Graham Scott

Metabolic detoxification and target site insensitivity to pyrethroids in *Aedes aegypti* from Veracruz, Mexico

**Beatriz Lopez-Monroy**, Brenda Silva-Salinas, Selene Marlen Gutierrez-Rodriguez, Olga Karina Villanueva-Segura, Gustavo Ponce-Garcia, Adriana E. Flores-Suarez

Analysis of variations in the gonotrophic cycle of two Colombian populations of *Aedes aegypti*, subjected to uncontrolled climatic conditions in Bogotá

**Jesús Eduardo Escobar**, Mabel Natalia Vargas Jasel Natalia Suarez, Ligia Ines Moncada

**Exhibits Open**

12:15 PM – 4:00 PM
*Grand Sierra Ballroom D-I*

**Poster Session Luncheon**

12:15 PM - 1:45 PM
*Grand Sierra Ballroom D-I*

**Adult Control**

**P-01** Evaluation of insecticide resistance in *Aedes albopictus* in North Carolina, 2017

**Stephanie Richards**, Avian White, Brian Byrd, Michael Reiskind, Michael Doyle

**P-02** Development of an attractive toxic sugar bait system using solid sucrose

**Caleb Lee Corona**, Joel R. Coats
P-03 Florida *Aedes aegypti* and *Aedes albopictus*: a statewide survey of pyrethroid resistance and knockdown resistance (kdr) mutations

**Sarah J. Bernard, Alden S. Estep, Neil D. Sanscrainte, Christy Marie Waits, James J. Becnel**

P-04 Evaluation of four pyrethroid-based insecticides for aerial applications targeting the black salt marsh mosquito, *Aedes taeniorhynchus* (Wiedemann), and the yellow fever mosquito, *Aedes aegypti* (Linnaeus), in Collier County, FL

**Rachel Bathsheba Bales, Kaci McCoy, Caroline Weldon, Alexandria Watkins, Keira J. Lucas**

P-05 Evaluation of insecticide-treated house screening on entomological infestation and arbovirus infection of *Aedes aegypti* during a Zika transmission period in Merida, Mexico

**Pablo Manrique-Saide**, Josue Herrera-Bojórquez, Anuar Medina-Barreiro, Emilio Trujillo-Peña, Josue Villegas-Chim, Norma Pavia-Ruz, Nina Valadez-González, Hugo Delfín-Gonzaléz, Juan Chablé-Santos, Fabian Correa-Morales, Felipe Dzul-Manzanilla, Azael Che-Mendoza, Juan Arredondo-Jiménez, Dr. Adriana E Flores-Suarez, Gonzalo Vázquez-Prokopec

P-06 Evaluation of EverGreen ULV 5-25 Ground at below label rate

**Kim Y. Hung**, Melissa Snelling, Christopher Cavanaugh, Arturo Gutierrez, Greg Alvarado Jennifer A. Henke

P-07 *Aedes aegypti* insecticide resistance in Puerto Rico

**Nicole Nazario**, Angela Harris, Mark Concepcion Reynaldo, Morales Marianyoly Ortiz, Luz A. Crespo

P-09 Cytochrome P450 mono-oxygenase and resistance phenotype in DDT and deltamethrin resistant *Anopheles gambiae* s.s. and *Culex quinquefasciatus*

**Ifeoluwa Kayode Fagbohun**, Olubunmi Adetoro Otubanjo Samson T Awolola, Tolulope Amos Oyeniyi, Emmanuel Taiwo Idowu, Taiye Shade Olusegun-Joseph
P-10  Field evaluation of natural essential oil misting and \( \lambda \)-cyhalothrin residual pesticide applications against medically important mosquitoes in Thailand  
Arissara Pongsiri, Alongkot Ponlawat, Silas A. Davidson, Seth Carroll Britch, Kenneth J. Linthicum, Robert L. Aldridge, Frances V. Golden

P-11  Pesticide resistance testing in Suffolk, VA targeting *Aedes albopictus* and *Culex pipiens*  
Charles Felipe Abadam, Karen Akaratovic, Jay Kiser

**Aerial Control/Aviation**

P-12  Community acceptance and perceived efficacy on aerial ultra-low volume application of insecticide for the control of *Aedes aegypti* in Puerto Vallarta, Mexico  
Josue Villegas-Chim, Pablo Manrique-Saide Alma, Medina Vázquez Francia, Espinosa Lizama Carolina, Martinez Cruz, Anuar, Medina-Barreiro, Norma Pavia-Ruz, Wilberth Bibiano-Marin, José Vadillo-Sanchez, Gonzalo Vázquez-Prokopec, Fabian Correa-Morales Armando, Elizondo-Quiroga

P-13  Efficacy against mosquitoes following aerial applications of DeltaGard\textsuperscript{®} insecticide in Stanislaus County, CA  
Jing Zhai, Neta Wicker, Bill Reynolds, Piper Kimball, Lloyd Douglass, Ming Hua Huang

P-14  Optimization of aerial larvicide applications in Placer County, CA: comparison of a spray system equipped with 2 vs 4 Micronair AU5000 rotary atomizers  
Jacob Hartle, Mario Boisvert, Jason Smith, Mary Sorensen

**Behavior/Biology**

P-15  Influence of water quality on predatory fish and *Culex quinquefasciatus* cohabitation  
Nicholas DeLisi, Lisa Rowley, Kevin Caillouet, Evan Davies
Enhanced attractiveness of *Aedes aegypti* to oviposition cups baited with a gravid infusion compared to cups baited with tap water  
**Katherine Ramirez, Jodi Holeman, Steve Mulligan**

Discovery of natural drimane sesquiterpene from Madagascan medicinal plants (*Cinnamosma* spp.) for mosquito vector control  
**Edna Ariel Alfaro, Peter M. Piermarini**

Immunomarking *Aedes aegypti* for use in mark-capture studies  
**Ryan R. Hemme, Marta I. Diaz Garcia, James R. Hagler, Scott A. Machtley, Gilberto E. Felix**

Evaluating different resting structures for targeting bloodfed mosquito populations in Salt Lake City, UT  
**Nadja Mayerle, Gregory White, Ary Faraji**

Vulnerable areas for potential invasion of *Anopheles darlingi* to the African continent  
**Juan C. Hernandez-Valencia, Mariano Altamiranda-Saavedra, Margarita M. Correa**

First record of *Aedes japonicus* in Florida  
**Michael Thomas Riles, Brian Byrd, John P. Smith, Nathan Burkett-Cadena, Gary W. Morse, Jr. C. Roxanne, Connelly**

Four years of larval mosquito surveillance in Iberia Parish, LA  
**David Lynn Martin, Tina Paredes**

Preferences of breeding containers for *Aedes* mosquitoes: a case study from Jamaica  
**Jervis Crawford, Kimalie Parchment, Tayshian Williamson, Carolina Torres Gutierrez, Jean Margaritis, Everton Baker**

Single mosquito coinfection with West Nile virus and Saint Louis encephalitis  
**James Will, John Townsend, Kirk Smith, Dan Damian, Steven Young**

Seasonal and geographic patterns in mosquito abundance along the TX/MX border  
**Christopher Vitek, Heather Hernandez**
P-28  Shifting the boundaries of traditional arbovirus testing
        Jackie Surls, Fuqu Hu, Daniel Portillo

P-29  Detection of two new invasive mosquito species in the United States, Culex panocossa and Aedeomyia squamipennis, and implications of putative range expansion
        Kristin Sloyer, Erik Blosser, Lawrence Reeves, Nathan Burkett-Cadena

P-31  Developing novel RT-PCR markers for detecting dog heartworm (Dirofilaria immitis) and other filarial worms
        Phillip Spinks, Joel Buettner

P-32  Comparison of sample processing methods for nucleic acid extraction and detection of West Nile virus in mosquitoes
        Jackie Surls, Fugu Hu

Education

P-33  Community communication: key in the implementation of a new integrated vector management program in Puerto Rico
        Marianyoly Ortiz, Julieanne Miranda-Bermúdez, Angela Pérez-Toro, Gabriela Algarín-Zayas, Natasha DeLeon-Rodriguez, Angela Harris, Luz A. Crespo

Equipment

P-34  Comparing the effectiveness of a twin tube CDC gravid trap, a BG-GAT and a BG-Sentinel trap in capturing female Aedes albopictus mosquitoes
        James Roberts, Jeff Blackford, Morgan Soderlund

P-35  A comparison of granular larvicide application methods
        Eleanor Kirkscey, Erin Plaisance, Hadis Hosseinzyadehnasiri

P-36  Dynamic placement of BG Sentinel traps for Aedes aegypti surveillance
        Christopher Cavanaugh, Kim Y. Hung

P-37  Comparison of truck larviciding equipment
        Jennifer A. Henke
Larval Control

P-38  Efficacy of expanded polystyrene beads (EPB) and diesel oil for mosquito (Diptera: Culicidae) control in integrated vector control management (IVM) methods
   Aliya Jabeen

P-39  Evaluation of bacterial larvicides and insect growth regulators employed for the control of *Aedes aegypti* from Yucatan Mexico
   Gabriela González Olvera, Fabián Correa Morales, Cassandra González-Acosta Jorge Alfredo Palacios Vargas Pablo Manrique Saide

P-40  Recent advances in Wide Area Larvicide Spraying (WALS™) technology are expanding the public health vector control tool box
   Leanne R Lake, Banugopan Kesavaraju Seleena Benjamin, Jacques Dugal, Peter DeChant

P-41  Blow ‘em out of the water: cool new tool for larval control
   Sean Amodt

P-42  Aquatain AMF: summary of trials and their implications for mosquito control
   Graham George Strachan

P-43  Bio-efficacy and persistence evaluation of a diflubenzuron larvicide formulation applied by air against rice-land mosquitoes in Greece
   Alexandra Chaskopoulou, Michail Miaoulis, Achilleas Mastoras

Latin America

P-44  Blood-meal preferences and avian malaria detection in mosquitoes (Diptera: Culicidae) captured at different land use types within a neotropical montane cloud forest matrix
   Carlos Antonio Abella-Medrano
Evaluation of a community’s perception of spatial emanators with metofluthrin for reducing the mosquito population in households from Ticul, Yucatan, south Mexico

Josue Villegas-Chim, Pablo Manrique-Saide, Carolina Martínez Cruz, Francia Espinosa Lizama, Alma Medina Vázquez, Anuar Medina-Barreiro, Wilberth Bibiano-Marín, Gonzalo Vázquez-Prokopec, Gregor J. Devine

Political will and community engagement for a Wolbachia-based strategy for the control of Aedes aegypti in Yucatan, Mexico

Josue Villegas-Chim, Pablo Manrique-Saide, Alma Medina Vázquez, Francia Espinosa Lizama, Carolina Martínez Cruz, Anuar Medina-Barreiro, Abdiel Martín-Park, Norma Pavia-Ruz, Zhiyong Xi

Application of integrated mosquito management (IMM) with digital mosquito monitoring system in South Korea

Hoonbok Yi, Yeon Jae BAE, Waggyu Kim, Sangwoo Seok, Jisoo Kim, Dong Gun Kim, Hwang Goo Lee, Jae Seung Yu, Jae Geun Kim, Hyesuk Baek,

A trial experiment for the effective reduction of mosquito population at a recreation area in South Korea

Hoonbok Yi, Sumi Na, Heeil Lee, Jae Seung Yoo, Yeon Jae BAE

Insecticide resistance evaluation in Laramie, WY

Milena C. Guajardo, Cassie Scott, Lee William Noel, Keith Wardlaw, Tyler Shevling, Steven Trowbridge, Janet McAllister

Integrated vector control management after two hurricanes

Marianyoly Ortiz, Angela Harris, Julieanne Miranda-Bermúdez, Natasha DeLeon-Rodriguez, Nicole Nazario, Luz A. Crespo
New Product Trials

P-51  Nootkatone: a new active ingredient for integrated management of disease vectors and other nuisance pests  
Giovanni Salarno, Owen Jones

Operations

P-52  A survey of mosquito species in ornamental bromeliads of Collier County, FL  
Alexandria Watkins, Rachel Bathsheba Bales, Keira J. Lucas

P-53  Laboratory for biological control of Aedes aegypti with Wolbachia in Yucatan, Mexico  
Pablo Manrique-Saide, Fabian Correa-Morales, Zhiyong Xi, Abdiel Martin-Park, Yamili Contreras, Anuar Medina-Barreiro, Norma Pavía-Ruz, Josue Villegas-Chim

P-54  Developing local capacity for Aedes aegypti surveillance using ovitraps in the Dominican Republic  
Patricio Murgueytio, Ingrid Marbella Miranda, Juan David Dominguez, Gavino Guzman, Mauricio Otalora, Nelson Grisales, Angel Solis, Sara Brujan

Other

P-55  Social assessment on an integrated intervention for the prevention of Zika and other Aedes-borne diseases in pregnant women and their families in Mexico  

P-56  Replacing RAMP with ELISA testing to diagnose West Nile virus positive mosquitoes  
Anthony Patullo
Correlation between geography and the gut microbiota of *Anopheles albimanus* mosquitoes

**Margarita M. Correa, Yadira Galeano Castañeda, Paula Urrea, Stefani Piedrahita, Yeraldine Zuluaga, Francesco Beghini, Nicola Segata, David Serre**

Implementing unmanned aerial systems (UAS) and aerial photography programs in mosquito control operations to detect urban breeding sources

**Jesse Erandio, Mir Bear-Johnson**

Repellency of carrot seed essential oil and its pure compounds against mosquitoes

**Abbas Ali, Mohamed M. Radwan, Amira Wanas, Ikhlas A. Khan**

Aerial ULV control of caged *Aedes aegypti* with naled in open and sequestered areas

**Cassie Scott, Brendan Carter, Peter H. Connelly, Ed Foster, Cynthia Harrison, Mark Latham, Sarah Michaels, Andrew Ruiz, Claudia Riegel**

The effects of mosquito adulticide exposure on red swamp crawfish (*Procambarus clarkii*)

**Timothy McNamara, Gregory Lutz, Christopher Green, Kristen Healy**

Effectiveness of a community clean-up event for the control of *Aedes aegypti*

**Jennifer A. Henke, Haide Vela-Alvarez**

Look-alike mosquito species and rare finds

**Heather Marie Ward, Kelsey Renfro, Michael Weissmann**
1:45 PM – 3:15 PM*  AFTERNOON SESSIONS
*unless otherwise noted

Young Professionals Symposium I &
Panel Discussion: Early, Mid, and Late
Career Challenges – Questions You May
Be Afraid to Ask
Moderator: Kristen Burkhalter
1:45 PM - 3:15 PM
Meeting Room: Grand Sierra C

1:45 Welcome and Introductions
2:00 Panel Discussion and Q & A

Discussion Panel:
Roxanne Connelly, Centers for Disease Control
Gary Goodman, Sacramento-Yolo Mosquito &
Vector Control District
Isik Unlu, Broward County Mosquito Control
Broox Boze, Vector Disease Control International

Attract, Trap, and Train Your Mosquito
Control Dream Team
Organizer/Moderator: Allison Allen
1:45 PM - 3:15 PM
Meeting Room: Curacao 5

1:45 132 Introduction
Allison Allen

1:50 133 Partners in vector control: mosquito
control done by pest control companies
and local health departments
Allison Allen, Chelsea L. Gridley-Smith

2:00 134 Building mosquito control capacity on a
shoestring budget
Shaun Craig May

2:15 135 Creation of mosquito control districts in
the United States: key aspects of
successful staffing, structure, and
funding options
Michael Stephen Doyle

2:30 136 Finding and hiring new employees
David Cooksey

2:45 137 Employee onboarding and training
Tom Jarzynka

3:00 138 Q & A
### Beekeepers and Mosquito Control: Building A Bridge Symposium II
**Moderator:** Bill Stanusek  
1:45 PM - 3:15 PM  
**Meeting Room:** Bonaire 1

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Number</th>
<th>Title</th>
<th>Speaker</th>
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<tbody>
<tr>
<td>1:45</td>
<td>139</td>
<td>Building collaborative projects with mosquito control and beekeepers</td>
<td>Kristen Healy</td>
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<tr>
<td>2:00</td>
<td>140</td>
<td>Educating beekeepers in the 21st century: online and experiential learning from the UF/IFAS Honey Bee Lab</td>
<td>Mary Bammer</td>
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<td>2:10</td>
<td>141</td>
<td>Honey bee and mosquito control coexistence</td>
<td>William H. Kern, Jr.</td>
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<td>2:25</td>
<td>142</td>
<td>Pesticide, parasite, and pathogen interactions on pollinator health</td>
<td>Troy Anderson</td>
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<td>2:40</td>
<td>143</td>
<td>Florida’s participation in the National Honey Bee Survey</td>
<td>Brandi Simmons</td>
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<td>2:50</td>
<td>144</td>
<td>Bee friendly mosquito control</td>
<td>Matthew Powell</td>
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<tr>
<td>3:00</td>
<td>145</td>
<td>Learning to talk like a beekeeper: mosquito control communications with the beekeeping community when confronted with reported honey bee colony losses</td>
<td>Daniel Killingsworth</td>
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### Latin American Symposium II
**Moderator:** Lee Cohnstaedt  
1:45 PM - 3:25 PM  
**Meeting Room:** Antigua 1

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<tr>
<th>Time</th>
<th>Session Number</th>
<th>Title</th>
<th>Authors</th>
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<tbody>
<tr>
<td>1:45</td>
<td>146</td>
<td><em>Aedes aegypti</em> insecticide resistance in Puerto Rico</td>
<td>Nicole Nazario, Angela Harris, Mark Concepcion, Reynaldo Morales, Marianyoly Ortiz, Luz A. Crespo</td>
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<td>1:57</td>
<td>147</td>
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<td>2:09</td>
<td>148</td>
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<td>2:21</td>
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<td>2:33</td>
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1:57  147  Susceptibility status of immature and adult stages of *Aedes aegypti* against conventional and biorational insecticides in Mexico

**Fabian Correa-Morales**, Cassandra González-Acosta, Miguel Moreno-Garcia, Rene Santos-Luna, Susana Roman-Perez, Pablo A. Kuri-Moraless, Gustavo Sanchez-Tejeda, Jesus F. Gonzalez-Roldan

2:09  148  Preventing the colonization of *Aedes* (*Stegomyia*) *aegypti* in new regions: Puerto Nariño, Amazonas, Colombia

**Freddy Ruiz-Lopez**, Enderson Murillo, Luz Adriana Agudelo, Carlos Larrañaga, Karen Robles, Alejandro Vergara, Laura Posada, Juliana Jaramillo, Juan Camilo Grisales-Nieto, Luis Alejandro Suarez-Ramirez, Luz Mila Murcia, Nohemi Hernandez, Guillermo Prieto, Ivan Velez

2:21  149  Heritability, frequency of kdr mutations and detoxifying enzymes, after deltamethrin selection in *Aedes aegypti* from Mexico


2:33  150  Evaluation of insecticides susceptibility through modification of microbiome in *Aedes aegypti*

**Mayra Alejandra Gómez-Govea**, Gabriel Ruiz-Ayma, Iram Pablo-Rodriguez, Adriana E. Flores-Suarez, Gustavo Ponce-Garcia, Armando Jimenez-Camacho, Antonio Gúzman-Velasco, Yamili Contreras-Perera
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<tr>
<td>2:45</td>
<td>151</td>
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<td>Silencing of the Dsx gene in <em>Aedes aegypti</em> for its population control <strong>Gerardo de Jesus Trujillo</strong>, Adriana E. Flores-Suarez, Gustavo Ponce-Garcia, Martha Patricia Lopez, Iram Pablo Rodriguez-Sanchez</td>
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<td>2:57</td>
<td>152</td>
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<td>A new high-resolution melting analysis for the detection and identification of <em>Plasmodium</em> in human and <em>Anopheles</em> vectors of malaria <strong>Enderson Murillo</strong>, Carlos Muskus, Luz Agudelo, Ivan Velez, Freddy Ruiz-Lopez</td>
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<td>3:09</td>
<td>153</td>
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<td>Importance of the assessment of the feeding patterns and co-existence of <em>Leishmania</em> sp. in <em>Lutzomyia</em> sp. captured in an anthropogenic zone <strong>Anayansi Valderram</strong></td>
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**Innovations and Discoveries in Mosquito Control Symposium**

**Moderator: Gregory White**

**Meeting Room: Curacao 1**

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<tr>
<td>1:45</td>
<td>154</td>
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<td>Use of technology and innovations to increase the efficacy of mosquito control and mosquito biology in Salt Lake City <strong>Gregory White</strong>, Nadja Marerle, Brad Sorensen, Andrew Dewsnup, Ary Faraji</td>
</tr>
<tr>
<td>2:00</td>
<td>155</td>
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<td>Advances in developing real-time mosquito-borne arbovirus surveillance <strong>Nathan Burkett-Cadena</strong></td>
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<tr>
<td>2:15</td>
<td>156</td>
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<td>Mid-IR spectroscopy and chemometrics for mosquito identification and characterization <strong>Scott Huffman</strong>, Lamyae Sroute, Stephanie Richards, Brian Byrd</td>
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<tr>
<td>2:30</td>
<td>157</td>
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<td>Creation of a temporary positive pressure spray booth and utilizing a Malvern Spraytec laser to improve mosquito control applications <strong>Mark Edwin Smith</strong></td>
</tr>
</tbody>
</table>
2:45 158 Evaluating the utility of wide-area larvicide spraying with VectoBac WDG for the control of urban-breeding *Culex pipiens*

Sarah Wheeler, Peter DeChant, Bret Barner, Steve Ramos, Samer Elkachef, Marcia Reed

3:00 159 How we can use "Minecraft" to teach a whole new generation about the importance of mosquito control

Kristen Healy, Andrew Garcia

3:15 PM - 4:00 PM  **BREAK, EXHIBITS OPEN**

Grand Sierra Ballroom

Break sponsored by Univar

4:00 PM – 5:30 PM*  **AFTERNOON SESSIONS**

*unless otherwise noted

**Disease/Vector Studies II**

Moderator: Colby Colona

4:00 PM - 5:30 PM

Meeting Room: Curacao 5

4:00 160 *Aedes aegypti* overwintering in Washington, DC

Andrew Lima

4:10 161 Evaluation of the accuracy of species distribution models related to arthropod vectors of medical importance

Justin Reginald Edward Barker, Hugh J. MacIsaac

4:20 162 Implementing loop-mediated isothermal amplification (LAMP) testing into Tangipahoa Mosquito Abatement District lab operations

Colby Colona

4:30 163 Jamestown Canyon virus revisited: Are we neglecting an under recognized disease?

Theodore Andreadis, Phillip Armstrong

4:40 164 Environmental surveillance for emerging arboviral diseases in Harris County for 2016 to 2018

Maximea Erasmea Vigilant, Mustapha Debboun
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<tr>
<th>Time</th>
<th>Session Number</th>
<th>Title</th>
<th>Presenter</th>
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</thead>
<tbody>
<tr>
<td>4:50</td>
<td>165</td>
<td>It doesn’t always block! <em>Wolbachia</em> effects on arbovirus infections in mosquitoes are variable</td>
<td>Jason L. Rasgon</td>
</tr>
<tr>
<td>5:00</td>
<td>166</td>
<td>40 years of sentinel chicken surveillance</td>
<td>Sherry Burroughs</td>
</tr>
<tr>
<td>5:10</td>
<td>167</td>
<td>Creating an inexpensive assay for the detection of West Nile virus (and others) in mosquito pools using the QuantStudio real-time PCR system</td>
<td>Chip Hancock</td>
</tr>
<tr>
<td>5:20</td>
<td>168</td>
<td>Transcriptional profile of lachesin in <em>Aedes aegypti</em>: developmental regulation and arbovirus infection</td>
<td>Liming Zhao</td>
</tr>
</tbody>
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**Tackling Ticks: Moving Beyond Mosquito Control Symposium**  
Organizer/Moderator: Dina Fonseca  
4:00 PM - 5:30 PM  
*Meeting Room: Bonaire 1*

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<th>Session Number</th>
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<th>Presenter</th>
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</thead>
<tbody>
<tr>
<td>4:00</td>
<td>169</td>
<td>The New Jersey Tick Blitz: leveraging the expertise of the mosquito control community for baseline tick surveillance</td>
<td>Andrea Egizi, Jim Occi, Dana Price, Dina M. Fonseca</td>
</tr>
<tr>
<td>4:15</td>
<td>170</td>
<td>Spotted fever <em>Rickettsia</em> present in ticks collected during the first New Jersey “Tick Blitz”</td>
<td>Jim Occi</td>
</tr>
<tr>
<td>4:30</td>
<td>171</td>
<td>NJ mosquito control professionals’ experience with the Tick Blitz</td>
<td>Sabrina Herron, Wayne Wurtz</td>
</tr>
<tr>
<td>4:45</td>
<td>172</td>
<td>Ticks vs. Mosquitoes</td>
<td>Dina Madeira Fonseca</td>
</tr>
<tr>
<td>5:00</td>
<td>173</td>
<td>Status of <em>Haemaphysalis longicornis</em> in the US</td>
<td>Denise Bonilla</td>
</tr>
<tr>
<td>5:15</td>
<td>174</td>
<td>Tick surveillance and control programs in the United States of America</td>
<td>Laura Harrington, Emily Mader, Annie Geiger</td>
</tr>
</tbody>
</table>
Latin American Symposium III
Moderator: Lee Cohnstaedt
4:00 PM - 5:40 PM
Meeting Room: Antigua 1

4:00 175 Re-introduction of indoor residual spraying as a tool to accelerate malaria elimination in Escuintla, Guatemala
Rodrigo Antonio Flores Sánchez, Juan Carlos Salazar Fernández, María Isabel Pedroza Estrada, Ruth Esther Hernández Chuc, Aura Lissett Galicia Alvizes, Zoraida Anabella Morales Monroy, Víctor Manuel Barrios Estefanía, Mónica Elizabeth Barrientos Juárez, Ligia María Díaz Morales, Daragh A. Gibson, Graziella Scudu, Javier López Sevilla, Darlene Bhavnani, Abigail Ward, Tara Seethaler

4:12 176 Spatial repellency and contact irritancy in *Aedes aegypti* to insecticides recommended for IRS and ITNs in Mexico
Olga Karina Villanueva-Segura, Yamili Contreras-Perera, Selene Marlen Gutierrez-Rodriguez, Gustavo Ponce-Garcia, Beatriz Lopez-Monroy, Miguel A. Torres-Villarreal, Juan I. Arredondo-Jimenez, Adriana E. Flores-Suarez, San Nicolas De Los Garza

4:24 177 Challenges and new technologies to control dengue, Zika, and chikungunya in Brazil
Fabio Castelo Branco Fontes Paes Njaime

4:36 178 Operational evaluation of modified larvitraps versus ovitraps for the monitoring of *Aedes aegypti* populations in Tapachula, Chiapas
Walter Eduardo Quezada-Yaguachi, Rosa Patricia Penilla-Navarro, José Genaro Ordóñez-González, Diego Morales Viteri, William C. Black IV, Americo David Rodriguez
4:48  179  Entomological efficacy of aerial ultra-low volume insecticide applications against *Aedes aegypti* in Mexico

**Fabian Correa-Morales**, Pablo Manrique-Saide, Felipe Dzul-Manzanilla, Wilberth Bibiano-Marín, José Vadillo-Sanchez, Anuar Medina-Barreiro, Abdiel Martín-Park, Gonzalo Vázquez-Prokopec, Armando Elizondo-Quiroga, Josue Villegas-Chim, Audrey Lenhart

5:00  180  Fludora Co-Max®: a new space spray combination for mosquito resistance management programs

**Lyla Aguilar Valenzuela**, Sebastian Horstmann, Frederic Schmitt, Jean-Christophe Thomas, Jason Nash, Ronald Vermeer, Frederic Baur

5:12  181  Eficacia biológica de Fludora CoMax® (Flupyradifurone 26.3 g IA/l + Transfluthrin 52.5 g IA/l) para el control de mosquitos adultos en rociado espacial domiciliario con niebla térmica aplicado con equipo portátil en México

**Aldo Ivan Ortega Morales**, Lyla Lourdes Aguilar Valenzuela, Quetzaly Karmy Siller Rodríguez, Jaime Thirion Icaza, Arturo Losoya Solís

5:24  182  Biological effectiveness of FLUDORA CO MAX (flupyradifurone EW 026.3 g / L + transfluthrin 052.5 g / L) for the control of mosquito vectors of dengue, chikungunya, and Zika virus in southern Mexico

**José Genaro Ordóñez González**, Luis Alberto Cisneros Vázquez, Américo David Rodríguez Ramírez, Ildefonso Fernández Salas, Kenia Mayela Valdez Delgado, Rogelio Danis Lozano
Operations/Genetics
Moderator: Kevin Caillouet
4:00 PM - 5:40 PM
Meeting Room: Curacao 1

4:00 183 The impact of Hurricane Irma on population density of the black salt marsh mosquito, *Aedes taeniorhynchus* (Wiedemann), in Collier County, FL
Keira J. Lucas, Alexandria Watkins, D. John Appezzato, Nate Phillips, Patrick P. Linn

4:10 184 Operating a new insectary from ground up
Erin Plaisance, Hadis Hosseinzadehnaseri, Eleanor Kirkscey

4:20 185 Lone-worker safety in mosquito control
Matthew Powell

4:30 186 “Tip this House” - A multi organizational mosquito-borne disease outbreak preparedness exercise under Incident Command System
Susanne Kluh

4:40 187 A summer of eastern equine encephalitis - Volusia County Mosquito Control response to EEE
Miranda Tressler, Suzanne Bartlett, Drake Alexander Falcon

4:50 188 Comparison of two trap-types for effective West Nile virus surveillance in St. Tammany Parish, LA
Kevin Caillouet, Nicholas DeLisi, Lisa Rowley

5:00 189 Direct mail, text messages, and an impossible goal - resolving 2,000 unmaintained swimming pools in three months
Jason Farned, Gilbert Holguin, Antonio Bishop, Bryan Sorvillo

5:10 190 Small but mighty: putting Richmond County Mosquito Control on the map
Annie Elizabeth Rich, A. Fred Koehle, G. Allen Hillman

5:20 191 Launching the next generation of self-limiting mosquitoes – a first look at Oxitec’s 2nd generation mosquito
Simon Warner, Michael Jooste
Simulating the dynamics of gene drive in mosquito populations
Margaret MacDonell, Charles Macal, Andrew Castiglioni, Jessiac Trail, Nicole Kikendall

Young Professionals Symposium II & Career Roundtable Discussions
Organizer/Moderator: Kristen Burkhalter
4:00 PM - 5:30 PM
Meeting Room: Grand Sierra C

Overview of the Career Roundtables and introduction of experts
Kristy Burkhalter, AMCA Young Professionals Advisor

Young Professionals will discuss career information and advice with experts from the following career paths for 15 minutes before moving on to the next table of experts.

Mosquito Control
Broox Boze, Vector Disease Control International
Aaron Lloyd, Pasco County Mosquito Control
Priscilla Matton, Bristol County Mosquito Control Project

Public Relations and Education
Michael Mut, Miami-Dade County
Roland Owens, Allen Wayne Publishing
Eva Buckner, University of Florida

Academia
Nathan Burkett-Cadena, University of Florida
Corey Brelsfoard, Texas Tech University
Patrick Irwin, Northwest Mosquito Abatement District

Federal/State
Roxanne Connelly, Centers for Disease Control
Elizabeth Andrews, California Department of Health
Marah Clark, Florida Department of Agriculture

Industry
Ed Bredemeyer, Central Life Sciences
Jane Bonds, Bonds Consulting Group
Jeff Hottenstein, Clarke
Wednesday, February 27, 2019

5:30 PM – 6:30 PM  **YOUNG PROFESSIONALS SOCIAL**
Grand Sierra B
Young Professionals Social is sponsored by AMVAC
8:30 AM – 10:00 AM* MORNING SESSIONS
*unless otherwise noted

Disease/Vector Studies III
Moderator: Michael Reiskind
8:30 AM - 10:00 AM
Meeting Room: Curacao 1

8:30 193 National Malaria Control Program of Uganda’s plans to implement integrated vector management, and larval source management in particular, in response to increasing insecticide resistance and changing vector behavior in Uganda
Wycliff Odude, Dorothy Echodu

8:40 194 Field evaluation of three different traps collecting Aedes aegypti in four parishes of Jamaica
Sashell Mckenzie, Kimalie Parchment, Jean Margaritis, Everton Baker, Carolina Torres Gutierrez

8:50 195 Public health entomology in North Carolina: reflections from a three-year university-government collaboration
Michael Reiskind, Brian Byrd, Stephanie Richards, Carl Williams, Michael Doyle

9:00 196 An examination of the effects of hurricanes on Culex nigripalpus populations in Indian River County, FL
Mark Kartzinel, Sherry Borroughs, Don Shroyer

9:10 197 Mosquito surveillance tools based on aptamer-gold nanoparticle conjugates for colorimetric detection of arboviruses

9:20 198 Updates for the Aedes aegypti sterile insect technique program in Lee County, FL
Rachel Morreale, David Hoel, T. Wayne Gale
A recent rise in murine typhus activity in Tarrant County, TX
Nina Marie Dacko, Abigail L. Cheney, Russell W. Jones

Lack of microfilarial enhancement of West Nile virus infection in American robins and common grackles associated with concurrent microfilarial infection
Michael J. Turell, Jefferson Vaughan, Elizabeth Andrews, Juanita Hinson

Evaluation of fungal recognition in the mosquito *Aedes aegypti*
Jose Luis Ramirez, Ephantus J. Muturi, Alejandro Rooney

**Equipment/New Product Trials**

**Moderator: Greg Williams**

8:30 AM - 10:00 AM

**Meeting Room: Bonaire 1**

Contrasting state and in-house laboratory arbovirus testing of sentinel chicken and mosquito samples
Milton Sterling

Strategic trap selection and placement for West Nile virus surveillance in San Gabriel Valley, CA
Melissa Ann Doyle

Scientific approach and innovative engineering solution for mosquito control
Anastasiia Romanova, Andriy Mushakov

Use of solar panels to charge batteries for adult mosquito traps
Lee William Noel, Janet McAllister, Milena Guajardo, Cassie Scott

The form and function of conducting caged trials
Derek Drews, Kattie Morris, Andrea Levey, Laetitia Leroy, Yemi Bullen-McClain

Latest results using automation for sterile mosquitoes manufacturing
Hanan Lepek
A novel compound (KCA1) attracts host-seeking and ovipositing *Aedes albopictus*: results from initial field evaluations
*Megan Saunders, Paul T. Leisnham, Kamal Chauhan*

A community-wide trial of In2Care traps in Volusia County, FL
*Drake Alexander Falcon, Miranda Tressler, Hong Chen*

Novel In2Care mosquito trap evaluation in highly urbanized environment in Harris County and the City of Houston, TX
*Martin Reyna Nava, Dagne Duguma, Elaine Chu, Greg Motl, Christopher Tarrand, Christopher Fredregill, Rebecca Riley, Mustapha Debboun*

**Public Relations/AMCARF**

*Moderator: Broox Boze*

8:30 AM - 10:00 AM

*Meeting Room: Curacao 5*

Haiti Mosquito Control Association: the evolution of an educational program for the citizens of Haiti
*Morel Jules*

Approaches to communicating pesticide risks to the general public: available resources from the National Pesticide Information Center
*April Strid, Amy Hallman, Jeffrey Jenkins*

Utilization of community surveys for development, implementation, and evaluation of messaging campaigns
*Ada Barros, Joel Buettner*

Boots on the ground: a look into a season with MMCD’s field staff
*Aubrey Marie Soukup*

A picture is worth a thousand words - leveraging GIS to engage, educate, and execute
*Broox Boze, Matt Parker, David Young*
Losing control – the rebranding of a modern mosquito management program
Andrea Roshaven, Ron Montgomery, Donnie Hayes

Adopting a new public engagement paradigm for novel vector control interventions
Kevin Gorman, Michael Jooste

Assessing the arboviral landscape via shotgun metagenome sequencing of honey-soaked FTA cards
Dana Price, Brian Johnson, Andrea Egizi

Field evaluation of arbovirus surveillance using honey cards
Kristy Burkhalter, Tim Garner, Jacob Hartle

Social Media and Mosquito Control Symposium
Organizer/Moderator: Michael Mut
8:30 AM - 10:05 AM
Meeting Room: Antigua 1

Social Media 101
Michael Mut

Social media and mosquito control
Justin Taylor

Using social media in and out of the classroom
Jillian Meek

Made you look! A starter guide to capturing attention using digital ads
Levy Sun

Using social media to effectively communicate scientific research in mosquito control
Natasha Marie Agramonte

Prevent & Protect: mosquito control messages for your community
Ricky Telg, Phillip Stokes, Ashley McLeod

Audiences, analytics, and ads: beyond the basics of digital outreach
Levy Sun
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<td><strong>BREAK, EXHIBITS OPEN</strong></td>
<td>Grand Sierra Ballroom D-I</td>
</tr>
<tr>
<td>10:45 AM – 12:00 PM</td>
<td><strong>AMCA ANNUAL MEMBER MEETING</strong></td>
<td>Antigua 1</td>
</tr>
<tr>
<td>12:00 PM - 1:30 PM*</td>
<td><strong>LUNCH</strong></td>
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<tr>
<td>1:30 PM – 4:00 PM</td>
<td><strong>FIELD DAY</strong></td>
<td>Pavilion and overflow lot</td>
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<td>4:00 PM – 6:00 PM</td>
<td><strong>FREE TIME</strong></td>
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<tr>
<td>6:00 PM – 7:00 PM</td>
<td><strong>PRE-BANQUET SOCIAL</strong></td>
<td>Grand Sierra Foyer</td>
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<td>Pre-Banquet Social</td>
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<td>Sponsored in part by</td>
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<td>ADAPCO</td>
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<tr>
<td>7:00 PM - 9:30 PM</td>
<td><strong>BANQUET</strong></td>
<td>Grand Sierra D</td>
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Aerial Control/Aviation/Education I
Moderator: Jane Bonds
8:30 AM - 10:00 AM
Meeting Room: Curacao 5

8:30 227 The influence of sprayer type and nozzle placement on spray deposition, uniformity and transport with remotely-piloted aerial spray systems
Jane Bonds, Andreas Herbst, Xionkui He, Zhichong Wang

8:40 228 Efficacy of DeltaGard® against Aedes aegypti when applied using an unmanned aircraft system (UAS) in Manatee County, FL
Kate Williams, Mark Latham, Christopher Lesser, Jing Zhai

8:50 229 First year UAV use and applications
Gary Hatch, Joel Shegrud

9:00 230 Distribution of mosquito mortality indoors and outdoors at a simulated urban site following aerial application of naled
Frances V. Golden, Seth C. Britch, Robert L. Aldridge, Kenneth J. Linthicum, Mark S. Breidenbaugh, Jennifer L. Remmers, Don Teig, Mark Latham, Peter H. Connelly, Charles A. Silcox

9:10 231 The art of outreach
Heather Althea-Rae Hyland

9:20 232 Developing the 3rd Edition of Florida’s White Paper on Mosquito Control
Douglas Carlson, Aaron Lloyd, Roxanne Connelly

9:30 233 How effective are traditional methods of public education for reducing mosquito breeding – is the rubber meeting the road?
Thomas Noftsinger
9:50 235 Outreach education by the Western Gulf Center of Excellence for Vector Borne Diseases  
Sonja L. Swiger

Biology/Behavior I  
Moderator: Isik Unlu  
8:30 AM - 10:00 AM  
Meeting Room: Curacao 1

8:30 236 The modern evolution of *Aedes aegypti* in Orange County, FL  
David M. Pelley

8:40 237 Utilizing new technology for mosquito surveillance: the BG Counter Trap – a game changer  
Marcia Reed, Sarah S. Wheeler, Deborah Dritz, Samer Elkashef

8:50 238 Evaluations of oviposition cues against *Aedes* mosquitoes under different conditions in Thailand  
Thanyalak Fansiri, Arissara Pongsiri, Chanyapat Nitatsukprasert, Patcharee Khongtak, Boonsong Jaichapor, Wachiraphan Chittham, Ampornpan Khaengleecha, Silas A. Davidson, Alongkot Ponlawat

9:00 239 Mosquito population trends in the United States Virgin Islands, 2017-2019 – what we know, what we don’t know, and why we need to know  
Krystal R. Seger, Brett R. Ellis

9:10 240 Identification of blood meal from mosquitoes vectoring dengue and West Nile virus in Korea  
Hyunwoo Kim, Sung-Chan Yang, Eun Jung Lee, Hee-II Lee, Shin-Hyeong Cho, Wook-Gye Lee

9:20 241 Evaluation of conspecific rearing water as attractant of gravid *Aedes aegypti*  
Agne Janusauskaite, Dennis Moore, Aaron Lloyd

9:30 242 Spatial analysis of aggregation behavior in larval *Aedes sierrensis* in response to environmental stimuli  
Cassandra Urquhart, Mary Beth Danforth, Jamesina J. Scott
Friday, March 1, 2019

9:40 243 Ovipositional responses of *Culex tarsalis* to semiochemicals associated with the western mosquitofish, *Gambusia affinis*, in laboratory bioassays
*Adena Why*, William Walton

9:50 244 Study of the behavior of *Culex tarsalis* in a rice field environment using a BG-Counter
*Mario Boisvert*, Joel Buettner

**Challenges and Opportunities in Vector-borne Disease Management and Vector Control Symposium I**

**Organizer/Moderator: Steven Su**
8:30 AM - 10:00 AM
**Meeting Room: Bonaire 1**

8:30 245 Arbovirus detection in mosquitoes: a review of options and opportunities
*Kristy Burkhalter*

8:50 246 Genomic epidemiology of Zika virus and West Nile virus in the United States
*Karthik Gangavarapu*, Nathan Grubaugh, Andrew Holbrook, Simon Dellicour, Saran Grewal, Ying Fang, Sarah Wheeler, Christopher Barker, Nikos Gurfield, Philippe Lemey, Marc Suchard, Kristian Andersen, Nate Matessson, Bram Vrancken, S. Lequime

9:10 247 Simultaneous detection of chikungunya, dengue, and Zika viruses in mosquitoes using RT-PCR
*Taylor Lura*, Tianyun Su, Michelle Brown

9:30 248 Regionalizing our view of mosquito and arbovirus surveillance data
*Christopher M. Barker*, Jody K. Simpson, Mathew Leland, David Heft, Vicki L. Kramer, Greg White, Kim Cervantes, Scott Crans, Grayson Brown
Water Management Symposium I
Moderator: Nina Dacko
8:30 AM - 10:00 AM
Meeting Room: Antigua 1

8:30  285  Dewatering the Savannah Harbor
dredge material containment areas
Ture Carlson

8:40  286  Mandated trash capture devices:
impeding trash without impeding
mosquito abatement
Joseph Huston

8:50  287  A brief overview of current and past
wetland impoundment and mosquito
ditching projects in Lee County, FL
Ed Foley

9:00  288  Opportunities with the advancement of
tidal marsh restoration in the San
Francisco Bay Area
Erika Castillo, Ryan Clausnitzer

9:10  289  Open Marsh Water Management
(OMWM) in Delaware
William Meredith

9:25  290  Salt marsh mosquitoes in human altered
environments and some novel water
management solutions – three projects
in The Norfolk County Mosquito Control
District, MA
David Lawson

9:40  291  On site sewage facilities and mosquito
breeding in Tarrant County, TX
Nina Dacko

10:00 AM - 10:30 AM  BREAK
Grand Sierra Foyer
Biology Behavior II/Larval Control
Moderator: John-Paul Mutebi
10:30 AM – 12:00 PM
Meeting Room: Curacao 1

10:30 249 Ecological and spatiotemporal dynamics of mosquito populations in waste tires in New Orleans
Jennifer Breaux, Mohamed Sallam, Claudia Reigel

10:40 250 A season-long study of tank bromeliads as larval mosquito habitat in southern California
Aviva Goldmann, Melissa Ann Doyle, William Walton

10:50 251 New county records of Aedes aegypti and Aedes epactius in Colorado
John-Paul Mutebi, Erik Ostrum

11:00 252 Evaluation of CocoBear and Aquatain AMF to control larval Culex quinquefasciatus in simulated organically enhanced habitats
Jim Cilek, Jason Fajardo, Robert L. Aldridge, Seth C. Britch, Kenneth J. Linthicum

11:10 253 Field trial of VectoBac® WDG applied by truck-mounted ULV sprayer in the Florida Keys
Heidi L. Murray

11:20 254 Evaluation of residual larvicides-treated plant saucers against Aedes albopictus larvae in semi and field conditions
Peter Jiang

11:30 255 Predation efficiency of carnivorous aquatic plants: a novel biocontrol method for container breeding mosquito vectors in the genus Aedes
Jannelle Couret, Marco Notarangelo
11:40 256  Wide Area Larvicide Spraying (WALS™) of a simulated neighborhood in Los Angeles County using the Adapco Guardian® 190 G4 and the A1 Super Duty®
   Tanya Posey, Susanne Kluh, Harold Morales, Peter DeChant, Stephanie Whitman, Steven Vetrone

11:50 257  Characterization of a broad-range yeast interfering RNA mosquito larvicide with a target site conserved in multiple disease vector mosquitoes
   Keshava Mysore, Chein-Wei Wang, Nicholas D. Scheel, Jacob S. Realey, David W. Severson, Na Wei, Molly Duman-Scheel

**Education II/GIS/GPS**
Moderator: Nancy Read
10:30 AM - 12:00 PM
Meeting Room: Curacao 5

10:30 258  Engaging citizen scientists in mosquito response using the iNaturalist social network, app and machine learning tools
   Durrell Kapan

10:40 259  Mosquito and vector control as special districts: opportunities and challenges
   Ryan Clausnitzer, Kyle Packham

10:50 260  Integrated vector management with ArcGIS Enterprise - Puerto Rico Vector Control Unit
   Cesar Piovanetti

11:00 261  Use of GIS-based routing app for turbine truck larviciding operations
   Michael Melendez, Odette Reza-Brown, Adriana Toro

11:10 262  Use of real time monitoring to improve implementation of vector control and entomological surveillance in Guatemala
   Miriam Vanessa Castillo, Carlos Enrique Cardenas
Impact of a relaxed residential do not spray policy on adulticiding operations  
Daniel Bartlett, Justin Harbison, Patrick M. Irwin

VectorBase: population biology (PopBio) and omics data for all vector species  
Gloria Isabel Giraldo-Calderón, Sarah Kelly, Samuel Rund, Robert MacCallum, George Christophides, Daniel Lawson, MaryAnn McDowell

Impact of a relaxed residential do not spray policy on adulticiding operations  
Ron Montgomery, Donnie Hayes

Drone-based photography for finding cattail mosquito habitat  
Nancy Read, Joe Elling

Challenges and Opportunities in Vector-borne Disease Management and Vector Control Symposium II  
Moderator: Steven Su  
10:30 AM - 12:10 PM  
Meeting Room: Bonaire 1

Validation of adulticides and adulticiding  
Jing Zhai

Mosquito larvicides and larviciding – enhancement and optimization  
Justin Harbison

Urban storm drains as significant mosquito breeding sources  
Michelle Brown, Alfonso Melgoza, Robert Garner, Alfredo Mejia, Tianyun Su

Challenges in evaluating mosquito control strategies in the urban environment  
F. Steve Mulligan

Challenges in vector-borne disease management and vector control  
William K. Reisen
Water Management Symposium II
Organizer/Moderator: Priscilla Matton
10:30 AM - 12:00 PM
Meeting Room: Antigua 1

10:30  292 Continuous deflector separators and their implications for mosquito control
Mark Daniel

10:40  293 An overview of water management in New Jersey
Victoria Thompson

10:50  294 Managing expectations – using state-level partnerships to evaluate mosquito control and wetland management for waterfowl
Jennifer Henke, Brian W. Olson, Joel Buettner, Matthew C. Ball, Conlin Reis, William Walton

11:00  295 Innovations in water management and mosquito source reduction analysis
Marty Scholl

11:10  296 Integrated marsh management: a holistic approach to managing coastal wetlands for multiple objectives
Roger Wolfe

11:25  297 Managing expectations – using state-level partnerships to evaluate mosquito control and wetland management for waterfowl
Douglas Carlson

11:40  298 Water management activities in Bristol County, MA
Priscilla Matton, Diana Brennan
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