WELCOME TO THE

SIXTY-SECOND
ANNUAL CONFERENCE
OF THE

NORTHWEST MOSQUITO AND VECTOR CONTROL ASSOCIATION

October 21-23, 2024

Icicle Village Resort
505 US Hwy 2
Leavenworth, WA 98826

NWMVCA Officers

President – Michael McKeague-Foster
President-Elect – Nikki Harris
Past President – Bob Boggs
Vice President – Shaun Calver
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Executive Director – Kelly Beehler

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Benton County Mosquito Control District
Leading Edge
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Adams County Mosquito Control District
Clarke
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North Morrow Vector Control District
Canyon County Mosquito Abatement District
Target Specialty Products
Central Life Sciences
Valent BioSciences
West Umatilla Mosquito Control District
Peststop
Veseris

Program Summary

Monday, October 21, 2024

12:00 PM	Golf Outing – Leavenworth Golf Club, 9101 Icicle Rd.

Tuesday, October 22, 2024

9:00 AM	Executive Committee Meeting, Wedge Mountain Room
9:00 AM	Exhibitor Set up, Tumwater Ballroom
10:30 AM	Registration
1:00 PM	Afternoon Session, Enchantments Ballroom
3:00 PM	Break
4:30 PM	Annual Business Meeting, Enchantments Ballroom
6:00 PM	Welcome Reception, Tumwater Ballroom

Wednesday, October 23, 2024

7:00 AM	Breakfast provided by the resort
7:30 AM	Exhibits open, Tumwater Ballroom
7:30 AM	Registration
8:15 AM	Morning Session, Enchantments Ballroom
10:15 AM	Break
11:30 AM	Lunch (sponsored)
12:45 PM	Afternoon General Session, Enchantments Ballroom
2:50 PM	Break
6:00 PM	President’s Reception, Enchantments Ballroom
7:00 PM	Annual Awards Banquet, Enchantments Ballroom
8:00 PM	Meeting Adjourns

Tuesday, October 22nd

Afternoon General Session

Moderator: NAME

1:00 PM *Call to Order and Introductions*, **Michael McKeague-Foster**, President NWMVCA

1:10 PM *Welcome to Leavenworth!* **Jenni Mullens**, Leavenworth Mosquito Control District and **Carl Florea**, Mayor, City of Leavenworth

1:30 PM *Vector-borne Disease, Climate Change, and Social Equity; Public Health's Role*, **Liz Dykstra, PhD, BCE**, Public Health Entomologist, Washington State Department of Health

2:00 PM *What's Cool about Emergency Response*? **Broox Boze, PhD**, Technical Director, Vector Disease Control International

2:15 PM *AMCA's National Communication Campaign for Mosquito Control: Yesterday's Threat, Today's Solutions*, **Daniel Markowski, PhD,** Technical Advisor, American Mosquito Control Association

2:45 PM *Update on AMCA efforts to gather data to enhance modeling programs used to assess adult mosquito control applications*, **Dave Brown**, Special Projects Coordinator, American Mosquito Control Association

3:00 PM Break – Sponsored by Frontier Precision

3:20 PM *Cruel Summer*, **Desireé Keeney**, Deputy Director, Ada County Weed, Pest and Mosquito Abatement, ID.

3:40 PM *ReMoa Tri: Triple Mode of Action, Triple District Attraction***, Nate Hill**, Valent BioSciences**, Tim Reissen**, Azelis A&ES

4:00 PM *Innovative Methods for Control and Surveillance,* **Fall Meeting Vendor and Sponsor Introductions**

4:30 PM NWMVCA Business Meeting

6:00 PM – 8:00 PM Welcome Reception, Sponsored by Clarke

Wednesday, October 23rd

Morning General Session

Moderator: NAME

8:15 AM	*Welcome Back* -**Michael McKeague-Foster**, President, NWMVCA
8:20 AM	*Marsh Madness*, **Josh Hightower**, Director, Cameron Parish Mosquito Abatement District No. 1, LA
8:40 AM	*The Natural History of Mosquitoes*, **Lawrence Reeves**, Assistant Professor, University of Florida
9:20 AM	*Utilizing Field Data for Decision-Making in Mosquito Control*, **Jodi Holeman**, District Manager, Consolidated Mosquito Abatement District, CA.
9:40 AM	*Trending Techniques for Analyzing Aerial and Ground-Based Mosquito Control Applications*, **Piper Reynolds**, Vector Biologist, Leading Edge Associates, Inc.
10:00 AM	*You Have How Many Ticks In Your Yard? Are You Sure They Are Ticks?* **Gary Goodman**, District Manager, Sacramento-Yolo Mosquito and Vector Control District, CA
10:15 AM	Break – Sponsored by Valent BioSciences
10:30 AM	*Oregon Ae. aegypti presentation*, **Andrew Partin**, Vector Ecologist, Jackson County Vector Control, OR.
11:00 AM	*An Overview of Division of Safety and Health (DOSH) Consultation Services Program*, **Michael Glazier**, Industrial Hygiene Consultant, Washington State Department of Labor and Industries
11:30 AM	Lunch provided by Central Life Sciences

Afternoon General Session

Moderator: NAME

12:45 PM	*Using UAS with FieldSeeker GIS Software & ArcGIS*, **Skylar Brown**, FieldSeeker Sales & Support Specialist, Frontier Precision, Inc.
1:00 PM	*West Nile virus Surveillance, Prevention, and Response in Washington State*, **Mary Chan & Lauren Sarkissian**, Epidemiologist & Health Services Consultant, Washington State Department of Health Zoonotic and Vector-borne Disease Program
1:20 PM	*First Experience with the Mosquito Monitoring Programme in Berlin, Germany* **Lukáš Murajda, PhD.**

2:00 PM	*Endangered Species Act and Pesticide Use*, **Tim Stein**, Area Supervisor, Washington State Department of Agriculture Agricultural Environmental Services, Pesticide Compliance, Washington State Department of Agriculture
2:50 PM	Break - Sponsored by AMGUARD Environmental
3:15 PM	*Do You Know What's In Your NPDES Permit?* **Angela Beehler**, North Pacific Regional Director, AMCA
3:30 PM	*Oropouche Virus and National News / AMCA Update*, **Dan Markowski, PhD.,** TA, AMCA
3:50 PM	*Program Update from the Northeast Regional Center for Excellence in Vector Borne Diseases*, **Jasmine Che,** Cornell University Department of Entomology, NY
4:10 PM	Updates from **NWMVCA State and Provincial Representatives**
4:25 PM	*Announcements, future meeting dates and locations*, **Nikki Harris**, President-Elect, Northwest Mosquito and Vector Control Association
6:00 PM	President's Reception – Sponsored by Valent Biosciences and Azelis
7:00 PM	Annual Awards Banquet

NORTHWEST MOSQUITO & VECTOR CONTROL ASSOCIATION 2024 ANNUAL MEETING SPONSORS

Tuesday Afternoon Break:

Frontier Precision

Tuesday Welcome Reception:

Clarke

Wednesday Morning Break:

Valent BioSciences

Wednesday Lunch:

Central Life Sciences

Wednesday Afternoon Break:

AMGUARD Environmental

President's Reception:

Valent BioSciences and Azelis

Program Sponsor:

Leading Edge

Audio/Visual Sponsor:

VDCI

ABSTRACTS

Tuesday

1:10 PM *Welcome to Leavenworth!* **Jenni Mullens**, Leavenworth Mosquito Control District and **Carl Florea**, Mayor, City of Leavenworth

10 minutes each

Brief history of mosquito control in the area.

1:30 PM *Vector-borne Disease, Climate Change, and Social Equity; Public Health's Role,* **Liz Dykstra, PhD, BCE**, Public Health Entomologist, Washington State Department of Health

30 minutes

Vector-borne diseases (VBD) are known to be impacted by a changing climate and environmental conditions, but the influence of social equity issues on VBDs can also play a role on the severity of VBDs on communities. This talk will examine how VBDs intersect with climate change and social equity, and public health's role in responding to these challenges.

2:00 PM *What's Cool About Emergency Response*? **Broox Boze, PhD,** Technical Director, Vector Disease Control International

15 min

While hurricanes and other natural disasters are disruptive and often leave significant destruction in their path, they also create some pretty cool phenomenon when it comes to mosquito biology. This presentation will focus on the diversity and abundance of mosquitoes collected after storm events, and the tools utilized to control them.

2:15 PM *AMCA's National Communication Campaign for Mosquito Control: Yesterday's Threat, Today's Solutions*, **Daniel Markowski, PhD,** Technical Advisor, American Mosquito Control Association

30 minutes

In 2024 at the annual meeting in Dallas, AMCA held a workshop to better understand the nature of public misconceptions about mosquito control and adulticides, in particular, and identify the best potential solutions and next steps to address it. One of the primary results of that workshop was a desire to develop a national communication campaign that could give our industry a unified voice and could be filtered to the local level. With information gathered in Dallas and from member surveys, we've developed a new campaign: Yesterday's Threat, Today's Solutions. One of the fundamental aspects of the campaign will be to

educate specific audiences about what we all do. This concept compares the ways life today has become more accessible and contrasts that with the problem mosquitoes yet pose. Mosquito control professionals know how to do this, but we, as the American public, need to invest (individually and collectively) in making it happen at scale. We can win this fight if we come together to do so. Yesterday's Threat, Today's Solutions uses humorous anecdotes from across time and history to make our point, then quickly directs people to go deeper and take action. We'll present all the ways that your program can participate in this campaign and truly make it your own!

2:45 PM *Update on AMCA efforts to gather data to enhance modeling programs used to assess adult mosquito control applications,* **Dave Brown**, Special Projects Coordinator, American Mosquito Control Association

15 minutes

AGDISP™ is one of the models used by the US EPA to assess the risks of pesticide applications. It was designed to optimize agricultural and forestry spraying operations and has detailed algorithms for characterizing the release, dispersion, and deposition over and downwind of the application area. This model has been used and validated for agricultural and forestry applications. Unfortunately, it has not been validated for area-wide adult mosquito control applications.

AMCA received a grant from the CDC to collect deposition data from actual mosquito control applications to be used to strengthen the reliability of the modeling output as it relates to adult mosquito control. This presentation will provide an update on the progress of the data collection.

3:15 PM *Cruel Summer*, **Desireé Keeney**, Deputy Director, Ada County Weed, Pest and Mosquito Abatement, Idaho

15 minutes

This presentation will include a song created to the tune of "Cruel Summer," which can be used to teach the general public about Integrated Mosquito Management. Pre-planning and post-season updates from Ada County MAD for 2024 and a look at what will come in 2025.

3:30 PM *ReMoa Tri: Triple Mode of Action, Triple District Attraction***, Nate Hill**, Valent BioSciences**, Tim Reissen**, Azelis A&ES

Pesticide resistance continues to be a widespread concern in the public health sector of mosquito control. With only two modes of action available for controlling adult mosquitoes in the US for over 30 years, pyrethroid resistance has become an issue for many districts, including those in the northwest and Utah. Three mosquito abatement districts partnered together in an effort to evaluate the effectiveness of their commonly used pyrethroid insecticide against

their local populations of adult mosquitos. Previous bottle bioassay testing, as outlined by the CDC, coupled with trapping both pre- and post-adulticide application with current pyrethroids on the market, suggested that pyrethroid resistance was occurring in each of their districts. This presentation evaluates the next steps taken by these three mosquito abatement districts to further validate their resistance concerns and to evaluate the impacts of a novel adulticide using the triple mode of action technology against their pyrethroid-resistant mosquitoes. Collection processes of targeted species, including Aedes Dorsalis and Culex tarsalis, preparing a grid for applying both adulticides individually to caged mosquitos for evaluation, and measuring mortality without bias will all be discussed during this presentation. Finally, the outcome of the severity of the pyrethroid resistance will be evaluated, in addition to the impacts and mortality rate of the novel adulticide, ReMoa Tri, as it pertained to this resistant population.

3:50 PM *Innovative Methods for Control and Surveillance,* **Fall Meeting Vendor and Sponsor Introductions**

40 minutes

Multiple speakers discuss products, traps, and tools

Wednesday, October 23rd

8:40 AM *Marsh Madness,* **Josh Hightower**, Director, Cameron Parish Mosquito Abatement District No. 1, Louisiana

20 minutes

Cameron Parish is the largest geographical parish in the state of Louisiana. It is comprised of 1937 square miles, including 652 square miles of water. It is in the southwest corner of the state along the Gulf of Mexico. It is a very "marshy" parish. The earliest settlers of the parish had to endure almost intolerable amounts of mosquitoes.

The first time that Cameron Parish received widespread mosquito spraying was in 1972. The military sprayed the western half of the parish to combat a Western Equine Encephalitis outbreak in Texas and was spreading towards Cameron Parish. The results were so good that the residents passed a parish-wide tax to start a mosquito control program, which started operations in 1973.

Fifty years later, the parish suffered one of its worst droughts in history. The drought was followed by severe coastal flooding, inundating the marshes parish-wide with salt water, leading to one of the worst fall, winter, and spring outbreaks of Aedes sollicitans mosquitoes in the history of Cameron Parish Mosquito Abatement District.

9:00 AM *The Natural History of Mosquitoes*, **Lawrence Reeves**, Assistant Professor, University of Florida

40 min

Few insects are more immediately recognized than mosquitoes, yet their natural history and the depths of their interactions with other organisms remain largely unknown beyond those who study them or work to control their impacts. Globally, more than 3,700 mosquito species have been described. There is tremendous variation among these species, and each is distinct. They vary in their morphology, their larval microhabitats, their life histories and strategies, the pathogens, if any, that they vector, and they vary in their host associations. Mosquitoes are so well known to humans, and so impactful, because the females of most species must take a blood meal from another animal to complete the development of their eggs. While blood serves a primarily reproductive function, plant-derived sugar is the food that fuels the daily life of a mosquito. It can be challenging to observe mosquitoes in nature, going about their lives and interacting with other organisms, outside of the moments when a female mosquito is attempting to feed from a human host. Even then, it remains a challenge to clearly see a mosquito and visualize its morphology. This presentation re-introduces the mosquitoes, summarizing their fascinating natural history, their profound interactions with other organisms, and new insights on mosquito ecology.

9:40 AM *Utilizing Field Data for Decision-Making in Mosquito Control*, **Jodi Holeman**, District Manager, Consolidated Mosquito Abatement District, CA.

20 minutes

The Consolidated Mosquito Abatement District has been using geographic information systems (GIS) since 2005. By developing new tools and platforms within the GIS workspace, the District has been able to better utilize the data it generates each year. This has led to the ability to analyze and visualize large datasets, resulting in data-driven decisions being made across the program. In an upcoming presentation, we will be sharing the different ways the District visualizes its field data for real-time and future decisions.

10:00 AM *Trending Techniques for Analyzing Aerial and Ground-Based Mosquito Control Applications*, **Piper Reynolds**, Vector Biologist, Leading Edge Associates, Inc.

15 minutes

Abstract: Mosquito application technologies and techniques are constantly advancing in response to the need for efficacious control efforts. At the same time, vector control professionals are very much aware of the need to reduce reliability on pesticides that continue to increase resistance modalities in the vector populations they seek to control. With innovations such as drones and

enhanced area-wide liquid larvicide sprayers becoming part of routine application equipment, the need to define and determine Standard Operating Practices (SOPS) for these applications becomes even greater. Based on field experiences and applied research recommendations, this presentation offers suggestions for enhancements to common techniques routinely used that could be considered when developing a SOP for an efficacious mosquito control program.

10:15 AM *You Have How Many Ticks In Your Yard? Are You Sure They Are Ticks?* **Gary Goodman**, District Manager, Sacramento-Yolo Mosquito and Vector Control District

15 min

The Sacramento-Yolo Mosquito and Vector Control District received a service call from a resident complaining about an inordinate number of ticks in their yard. Because the resident lived in a dense urban neighborhood of Sacramento, the District requested a sample to confirm the presence of ticks. A plastic bag containing 12 ticks was delivered to the District. All the ticks were identified as brown dog ticks (Rhipicephalus sanguineus), a vector for Rocky Mountain spotted fever. The District responded to the service request and found an overwhelming number of brown dog ticks spread across multiple yards where almost every house had at least one dog in residence. This talk will explore the surveillance methods implemented, collaboration with experts from the University of California, Davis to help identify the source of the ticks and any potential disease carried by the ticks, and the different tick control interventions implemented.

10:30 AM *Aedes aegypti in Oregon*, **Andrew Partin,** Vector Ecologist at Jackson County Vector Control, OR.

30 minutes

On July 23, 2024, a single *Aedes aegypti* was found in Talent, Oregon, marking the first time this species has been found in Oregon. Since the initial detection, Jackson County Vector Control District (JCVCD) has detected 120+ *Aedes aegypti* mosquitoes from 26 trap locations throughout the city of Talent. Some of the specimens collected have been sent to Yale University for genetic testing to determine their origin.

JCVDC is working with an extensive list of stakeholders to eradicate Aedes aegypti through awareness, detection, and prevention strategies. Public outreach and support are vital, and JCVCD has set up a webpage for aegypti education, resources, and an online reporting form for day-biting mosquitoes.

11:00 AM *An Overview of Division of Safety and Health (DOSH) Consultation Services Program*, **Michael Glazier**, Industrial Hygiene Consultant, Washington State Department of Labor and Industries

30 minutes

I intend to talk about DOSH's Consultation and Risk Management Services that are available to employers statewide. I want to cover some safety and health basics that all employers should know about when it comes to safety and health in their workplaces. Whether it's knowing what needs to be done in the event of an injury, when issuing and using personal protective equipment (PPE), working with chemicals, working from heights, or working near road traffic, just to name a few things, there is most likely a regulatory safety standard that would cover such work activities. My intent is to get people to think about what safety and health hazards they might commonly encounter on the job, drive home the importance of hazard awareness, and to provide the audience information on how they can request and what they can expect from a DOSH Safety and Health Consultation.

11:30 AM Lunch – Sponsored by Central Life Sciences

Afternoon General Session

Moderator: NAME

12:45 PM *Using UAS with FieldSeeker GIS Software & ArcGIS*, **Skylar Brown**, FieldSeeker Sales & Support Specialist, Frontier Precision, Inc.

15 minutes

Learn how FieldSeeker GIS and ArcGIS Online integrate with drone systems for mapping, inspection, and treatment. We'll consider how treatment drones can use Proposed Treatment Areas from FieldSeeker, and how treatment flight records from US-made Hylio and other drone systems can be imported into FieldSeeker. We'll also look at how to use imagery from mapping drones in FieldSeeker and ArcGIS Online.

1:00 PM *West Nile virus Surveillance, Prevention, and Response in Washington State* – **Mary Chan & Lauren Sarkissian**, Epidemiologist & Health Services Consultant, Washington State Department of Health Zoonotic and Vector-borne Disease Program

20 min

Preventing West Nile virus (WNV) in Washington state requires robust surveillance and response efforts. Collaboration between state and local health departments, mosquito control districts, military partners, and academic institutions makes WNV prevention possible. This presentation will discuss the Department of Health's WNV surveillance program, the use of WASurv as a centralized data reporting system, the development of communication and educational resources, and the implementation of a WNV response plan.

1:20 PM *First Experience With the Mosquito Monitoring Programme in Berlin, Germany*
Dr. Lukáš Murajda

40 minutes

Germany´s capital city Berlin had been considered too far north (52°31′12″N 13°24′18″E) for invasive species like Aedes albopictus (Asian tiger mosquito). However, since 2021, there has been evidence of established populations of the tiger mosquito on the outskirts of the city. During a meeting with the health authorities, it was decided that a simple mosquito monitoring programme should be started. This decision was confirmed in July 2024 by a political appointment from the government of the federal state of Berlin, putting the Health Authority of Central Berlin in charge of the monitoring for the entire federal state.

The monitoring programme consists of a passive collection of information (citizens' science), where simple information or a photograph can be sent via e-mail, or a mosquito can be sent via post (a letter) to the Health Authority, and of an active search for mosquitoes in preselected areas.

The main goal is to verify the reports on tiger mosquitoes and to monitor the sites where tiger mosquitoes have been identified (for at least two consecutive years) to assess the distribution of tiger mosquitoes in the city. In collaboration with Robert Koch-Institute (national public health authority in Germany), found samples can be tested for pathogens. An important part of the programme is capacity building, in order to create a resilient public health network to prevent possible future outbreaks of diseases like dengue, zika, chikungunya or West Nile fever, according to One Health principle.

The mosquitoes are collected using BG Pro and BG GAT traps, with carbon dioxide and other attractants, without light. The specimens are identified using the AI diagnostic entomology system (IDx) by Vectech.

Since the beginning of the programme one year ago, tiger mosquito was identified in four city districts (out of twelve). There has been no evidence neither on pathogens, nor on autochthone human or animal infection cases yet.

In the current phase of the programme we focus on communication with the public and the increase in health literacy. The main topics are prevention of breeding sites, personal protection and travel medicine.

2:00 PM *Endangered Species Act and Pesticide Use,* **Tim Stein**, Area Supervisor, Washington State Department of Agriculture

50 minutes

I will cover recent pesticide label changes, Bulletins Live! Two, and proposed mitigation strategies and how they impact mosquito control operations.

3:15 PM *Do You Know What's In Your NPDES Permit?* **Angela Beehler**, North Pacific Regional Director, AMCA

Under the Clean Water Act, National Pollutant Discharge Elimination System (NPDES) Permits are required for any pesticide discharge over, near, or to the Waters of the United States (WOTUS). The Environmental Protection Agency and/or the authorized authority in each state must renew these permits every five years. This presentation will highlight language within the current permits throughout the region to assist applicators in maintaining compliance.

15 minutes

3:30 PM *AMCA Update: 2024 Oropouche and Other National News*, **Dan Markowski**, TA, AMCA

20 minutes

It's been a busy summer for AMCA and our members. From new disease outbreaks, such as Oropouche virus, to working on our outreach and other membership projects, 2024 hasn't slowed down. A new Virtual Training Program has been developed to augment our Emergency Response BMP and is now available for use by the public. We're also moving full speed ahead on the long-needed work to evaluate the drift models that inform the EPA and Services risk assessments of our adulticide applications. There's a new UAS program and website that will standardize the FAA permits needed by each agency that conducts applications with a drone. And, of course, the association has been very active advocating for appropriate ESA mitigations as required by the EPA and the Services that will soon be required for all mosquitocide applications. We'll even be launching a new national communications campaign to promote the notion of sound mosquito control practices next year. There's a lot for our members to take advantage of and utilize to help prepare for next summer.

3:50 PM *Program Update from the Northeast Regional Center for Excellence in Vector Borne Diseases*, **Jasmine Che,** Cornell University Department of Entomology, NY

20 minutes

NEVBD transitioned to a Teaching & Evaluation Center for the Prevention and Control of Vector-Borne Diseases in July 2023. Their work focuses on providing responsive training to the current and future public health entomology workforce, supporting evaluations of existing programs and strategies for vector-borne disease prevention and control, and fostering partnerships between public, private, and academic institutions to collaborative support these efforts.