

Janet T. Mills
Governor



Maine Department of Health and Human Services
11 State House Station
Augusta, Maine 04333-0011

Briefing Memo

To: Megan Patterson, Board of Pesticides Director
From: Sara Robinson, Infectious Disease Epidemiology Program Director
Subject: Mosquito Monitoring Collaboration
Date: February 27, 2019

Issue: Maine CDC is responsible for environmental monitoring of mosquitoes in Maine. This monitoring consists of trapping and identification of mosquitoes, testing of certain species for Eastern Equine Encephalitis virus and West Nile virus, and monitoring specific species for pesticide resistance. Federal funding for these activities is sporadic and must be supplemented with other funds in order to maintain a consistent program.

Background: Maine CDC began monitoring for arboviruses in 2001 after the introduction of West Nile virus into the United States. Maine's first positive mosquito pool occurred in 2002 and surveillance has continued annually since then. Funding fluctuates frequently for environmental monitoring, so Maine attempts to maintain historical trap sites, particularly those in areas with a previous positive. When additional funding is available trap sites expand to new areas. In response to Zika's arrival in the United States in 2016 Maine expanded trapping to specifically look for *Aedes* species in our four urban areas. Using federal Zika response funds Maine also developed the capacity to test for pesticide resistance in mosquitoes here in Maine. This testing began in 2018 and has not identified resistance to date. Maine CDC has a Memorandum of Understanding with the Maine Board of Pesticide Control (BPC) that BPC will provide at least \$25,000 for mosquito monitoring annually when funds are available.

Justification: Environmental monitoring is the first indication that a virus is in the state and prompts notification and response activities. In the event the Commissioner declares an Arboviral Public Health Threat BPC is expected to assist in the response including coordinating any use of pesticides.

Next Steps: Discuss the possibility of increased BPC financial support for the 2019 season during the March 8th Board meeting.

Attachments:

1. Historical Arboviral Surveillance in Maine
2. Maine CDC - BPC mosquito monitoring MOU

Historical Arboviral Surveillance in Maine

- **2001: WNV presence found in Maine, September 2001**
 - 6 birds tested positive for WNV
 - 1 bird tested positive for EEE
- **2002:**
 - 60 birds tested positive for WNV
 - 1 mosquito pool (collection of mosquitoes) tested positive for WNV from Wells, ME
 - 1 bird tested positive for EEE
- **2003:**
 - 98 birds tested positive for WNV (July – October)
 - 2 mosquito pools positive for WNV from Brunswick, ME
- **2004:**
 - 1 bird tested positive for WNV (August)
- **2005:**
 - 22 birds tested positive for WNV (July – October)
 - 1 mosquito pool tested positive for EEE from York, ME (October)
 - 2 horses tested positive for EEE in York County (September, October)
 - 12 birds tested positive for EEE (September, October)
- **2006:**
 - 11 birds tested positive for WNV (July – September)
- **2007: No recorded WNV or EEE activity in Maine**
- **2008: No recorded WNV activity in Maine**
 - 1 mosquito pool tested positive for EEE from Arundel, ME (September)
 - 1 horse tested positive for EEE in York County (September)
 - A fatal case of EEE was diagnosed in a Massachusetts resident who may have acquired the infection while vacationing in Cumberland County
- **2009: EEE Outbreak Year in Maine**
 - 15 horses tested positive for EEE (August – October)
 - 12 confirmed
 - 3 suspect
 - Spread over 5 counties in ME (York, Cumberland, Kennebec, Waldo, Penobscot)
 - 1 llama tested positive for EEE from York Beach, ME (September)
 - 3 flocks of pheasants tested positive for EEE from S. (September, October)
 - South Berwick, Parsonsfield, Dayton
 - 2 mosquito pools tested positive for EEE from York County (September)
 - 1 mosquito pool tested positive for WNV from York County
- **2010: No recorded EEE activity in Maine**
 - 1 seropositive Wild Turkey from Penobscot County

- 1 mosquito pool tested positive for WNV from York County
- **2011: No recorded WNV in Maine**
 - 10 Turkeys sero-positive for EEE (indicates prior infection, not active virus)
- **2012:**
 - 7 mosquito pools tested positive for WNV from Lebanon & Gorham
 - First pool collected 8/1/2012 – Earliest virus has been found in MOSQUITOES in Maine
 - 1 pheasant flock with EEE
 - Flock came down with illness in first week of September, culled to stop further transmission
 - Maine's first WNV + human
 - Symptom onset 10/1/2012, meningitis, encephalitis, double vision, fever, overall muscle weakness. No travel history.
 - 2 EEE sero-positive songbirds via a research project between BRI & MMCRI, collected in May
- **2013:**
 - 26 EEE positive mosquito pools all from York county
 - First pool collected 7/16/2013 – Earliest virus found in mosquitoes in Maine
 - Most positive mosquito pools ever
 - 3 EEE positive horses from Somerset, Oxford and York counties (September)
 - 1 EEE positive Emu from Cumberland (September)
 - 1 EEE positive Pheasant from York (September)
 - 3 WNV positive mosquito pools all from York county
 - 1 positive Powassan case in an adult female from Knox county
 - First Powassan since 2004
 - Case was fatal
 - Onset was late October
- **2014: No recorded WNV activity in Maine**
 - 22 EEE positive mosquito pools all from York county (August, September)
 - First pool collected 8/20/2014
 - 1 EEE positive Emu from Cumberland county (September)
 - 1 EEE positive case in an adult male from York county
 - First EEE case in Maine resident
 - Symptom onset 8/22/2014, fever, encephalitis, confusion. Travel to New Hampshire. Hospitalized 15 days.
- **2015:**
 - 1 EEE positive mosquito pool from York county (September)
 - 1 EEE positive case in adult male from York county
 - First human fatality from EEE in Maine. Died on 10/17/2015.

- Symptom onset 9/30/2015, fever, encephalitis, altered mental status. Travel to Massachusetts, Connecticut. Hospitalized 13 days in New Hampshire.
 - 1 WNV positive mosquito pool from York county (September)
 - 1 WNV positive case in adult male from Cumberland county
 - Symptom onset 9/2/2015, fever, rash, myalgia, nausea, aseptic meningitis, encephalitis. Travel to Delaware, Maryland. Hospitalized 5 days.
 - 1 POW positive case in adult female from Cumberland county
 - Symptom onset 11/11/2015, fever, nausea, chills, vomiting, confusion. No travel history. Hospitalized 9 days.
- **2016: No recorded EEE or WNV activity in Maine**
 - 1 POW positive case in adult female from Cumberland county
 - Symptom onset 10/8/2016, fever, nausea, vomiting, fatigue, stiff neck, seizures, cognitive decline. No travel history. Hospitalized 30 days in Massachusetts.
- **2017: No recorded EEE or WNV activity in Maine**
 - 3 POW positive cases
 - 1 adult male from Cumberland county
 - Symptom onset 5/27/2017, fever, nausea, aseptic meningitis, encephalitis, altered mental status. No travel history. Hospitalized 14 days.
 - 2 adult males from Knox county
 - Symptom onset 4/28/2017, fever, encephalitis, ataxia. No travel history. Hospitalized 20 days in Massachusetts.
 - Symptom onset 4/28/2017, fever, aseptic meningitis, encephalitis, altered mental status, CNS involvement. No travel history. Hospitalized 8 days.
 - 2 JCV positive cases, both locally-acquired
 - 1 adult female from Kennebec county
 - First JCV positive case in Maine resident
 - Symptom onset 6/9/2017, fever, headache, nausea, encephalitis, altered mental status, falls, septic shock. No travel history. Hospitalized 19 days.
 - 1 adult female from Franklin county
 - Symptom onset 6/27/2017, fever, headache, myalgia, arthralgia, syncope, neck pain, fatigue, cough, coryza. No travel history. Not hospitalized.
- **2018: No recorded EEE activity in Maine**
 - 4 WNV positive mosquito pools from York and Penobscot counties (August, September)
 - 1 WNV positive horse from York county (September)

- First WNV positive horse in Maine
- 2 WNV positive cases, travel-acquired
 - 1 adult male from Cumberland county
 - West Nile Encephalitis (neuroinvasive)
 - Symptom onset 8/8/2018, fever, headache, rash, encephalitis, weakness, ataxia, aphasia, anorexia, dizziness. Multistate travel. Hospitalized 4 days in Missouri.
 - 1 adult female from Cumberland county
 - West Nile Fever (non-neuroinvasive)
 - Symptom onset 9/11/2018, fever, headache, myalgia, arthralgia, nausea, diarrhea, thrombocytopenia, hyponatremia, tachycardia, afib. Travel to New York. Hospitalized 3 days in New York.
- 1 JCV positive case in adult female from Knox county, locally-acquired
 - Symptom onset 8/31/2018. Fever, headache, encephalitis. Travel to Florida (travel not during exposure period). Hospitalized 11 days.
 - Patient died 9/25/2018. Second JCV reported death in US.

Seropositive animals or animals with active illness have been found in 15 of Maine's 16 counties. Seropositivity does not indicate active infection.

Maine discontinued testing birds in 2006.

Memorandum of Understanding
Between
Maine Center for Disease Control and Prevention (Maine CDC),
Department of Health and Human Services,
And
Board of Pesticides Control,
Department of Agriculture, Conservation and Forestry

I. PURPOSE: The purpose of this agreement is to establish cooperation between the Maine Center for Disease Control and Prevention (Maine CDC), Department of Health and Human Services, and the Board of Pesticides Control (BPC), Department of Agriculture, Conservation, and Forestry to conduct surveillance for mosquito-borne diseases to protect public health.

II. AUTHORITY: The principal statutory authority for Maine CDC to control communicable diseases is established at 22 M.R.S.A. Chapter 250.

The principal statutory authority for the Maine Board of Pesticides Control is established at 22 M.R.S.A. Chapter 258-A.

III. GENERAL:

Maine CDC has established activities related to surveillance and control for mosquito-borne diseases. The purpose of surveillance is to describe the magnitude and characteristics of mosquito-borne disease in Maine, prevent human infection, and provide consultation and guidance on prevention and control of mosquito-borne illnesses.

The BPC conducts activities related to the use of integrated pest management, including the use of pesticides, to control and prevent mosquitos and other pests. Rules and regulations exist to ensure pesticides are used and applied appropriately.

IV. RESPONSIBILITIES:

A. The Maine Center for Disease Control and Prevention will:

1. In collaboration with partners, conduct surveillance for mosquito-borne diseases through active collection and testing activities each year.
2. Consult with the Maine State Vector Borne Disease Work Group to establish annual collection, sampling and testing procedures.
3. Publish the results of mosquito surveillance through weekly reports, health alert messages, and other communications.
4. Utilize the results of annual mosquito surveillance to inform disease response planning and interventions.

B. The Department of Agriculture, Conservation, and Forestry will:

1. Participate in the Maine State Vector Borne Disease Work Group.
2. Provide technical advice on Integrated Pest Management strategies.
3. Provide personnel to support mosquito surveillance, and planning activities in the event that mosquito control programs are deemed necessary for the protection of the public health.
4. Provide the Maine CDC financial support for annual mosquito-borne disease surveillance of at least \$25,000 annually, provided that the Department determines that sufficient funding is available for such purposes.

V. AGREEMENT AND ADMINISTRATION:

A. Management:

1. Effective date: The provisions contained within this MOU are effective beginning on the date of the last signature and shall expire on June 30, 2019.
2. Review: No amendment to this agreement shall be effective unless in writing and signed by both parties.
3. Termination: This agreement may be terminated at any time by written agreement of the parties, or by either party upon the provision of written notice to the other party at least thirty (30) days prior to termination.

B. Point of Contact:

1. Board of Pesticides Control, Department of Agriculture, Conservation, and Forestry, Board of Pesticides Control
Henry Jennings
Maine Board of Pesticides Control
28 State House Station
Augusta, ME 04333-0028
Phone: 207-287-2731
Email: henry.jennings@maine.gov

2. Maine Center for Disease Control and Prevention, Department of Health and Human Services

Lori Wolanski MPH

Maine CDC

Division of Infectious Disease

286 Water Street,

11 State House Station

Augusta, ME 04330-0011

Phone: 207-287-6448 (desk) or 1-800-821-5821 (24-hour disease reporting line)

Email: lori.wolanski@maine.gov

Signatures:

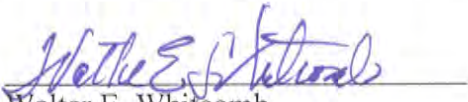
Department of Health & Human Services:



Mary C. Mayhew
Commissioner

Date: 6/18/14

Department of Agriculture, Conservation, and Forestry:



Walter E. Whitcomb
Commissioner

Date: 6/24/14