Arbovirus Surveillance Summary, 2011
Massachusetts Department of Public Health (MDPH)
Arbovirus Surveillance Program

WEST NILE VIRUS (WNV)

Birds

The MDPH Arbovirus Surveillance Program discontinued routine dead bird reporting in 2009 because data indicated that bird mortality no longer correlated with presence of the virus. Bird die-offs can and do occur for reasons unrelated to WNV infection and they can be reported to the Massachusetts Division of Fisheries and Wildlife (MDFW). Poultry flocks experiencing sudden illness or mortality should be reported to the Massachusetts Department of Agricultural Resources (MDAR).

Mosquito Samples

Of 4,604 mosquito samples collected in Massachusetts in 2011, 275 (6.0%) were positive for WNV. Positive samples were identified in 88 towns in 11 counties. Positive mosquito samples included 223 *Culex pipiens/restuans* complex, 1 *Culex pipiens*, 23 *Culex* species, 24 *Culiseta melanura*, and 1 *Coquillettidia perturbans*. Mosquitoes in the *Culex* genus feed mainly on birds and occasionally on mammals, including humans. *Culex pipiens* and *Culex restuans* are primarily responsible for WNV transmission between birds in Massachusetts. *Culiseta melanura* feeds almost exclusively on birds and is the primary enzootic vector of eastern equine encephalitis (EEE) virus, although it can also carry WNV. *Coquillettidia perturbans* is an aggressive mammal-biting mosquito and can be involved in the transmission of both WNV and EEE virus to humans in Massachusetts. For a complete list of positive mosquito samples by city/town, please see the annual Cumulative Mosquito Summary by County and Municipality report.

Animals

One horse tested positive for WNV in 2011. This horse was stabled in Hampshire County, had an illness onset of 9/3/2011, and had not been vaccinated against WNV.

Humans

There were six human cases of WNV infection identified in Massachusetts in 2011, as summarized below.

County	Age Range	Onset Date	Virus Result	Clinical Presentation
Essex	40-64	10/3/2011	WNV	meningitis
Middlesex	40-64	9/13/2011	WNV	meningitis
Middlesex	40-64	8/30/2011	WNV	meningoencephalitis
Middlesex	40-64	8/13/2011	WNV	meningitis
Norfolk	40-64	9/17/2011	WNV	meningitis
Worcester	over 64	9/3/2011	WNV	meningitis

The number of confirmed human cases nationwide was lower in 2011 (690) compared with 2010 (981).

Specimens Tested and WNV Positive by Year, 2007-2011

Species	2007		2008		2009		2010		2011	
	Tested	Positive	Tested	Positive	Tested	Positive	Tested	Positive	Tested	Positive
Birds	223	43	139	63	n/a	n/a	n/a	n/a	n/a	n/a
Mosquito Pools	7271	65	4575	136	3410	26	3558	121	4604	275
Animal	8	0	14	0	13	1	17	1	16	1
Humans	392	6*	385	1	267	0	383	7	349	6

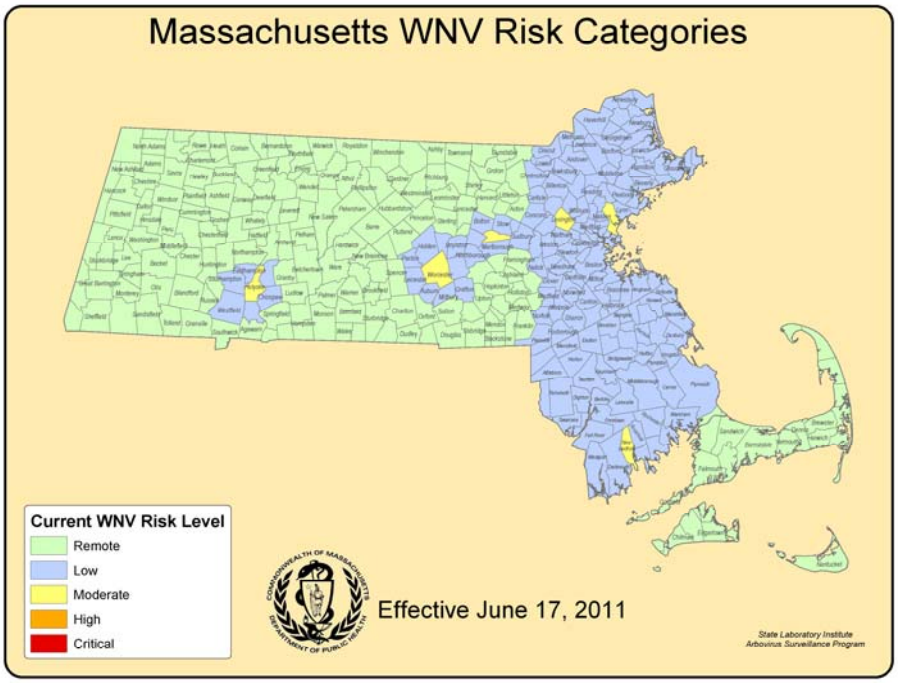
* One MA case exposed out-of-state and two out-of-state cases exposed in their home states are not included.

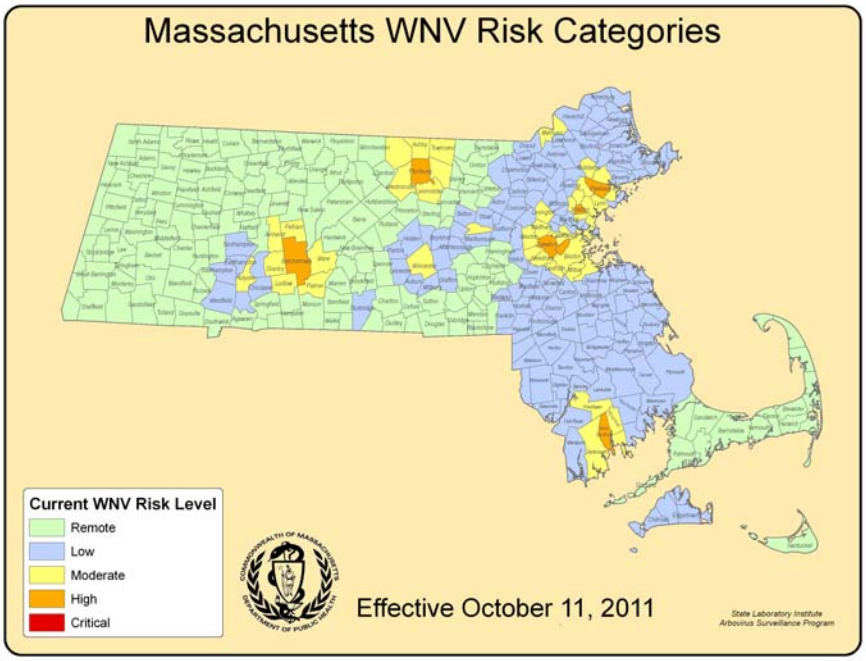
WNV Geographic Risk Levels

Arbovirus risk maps are produced by integrating historical data and areas of mosquito habitat with current data on positive virus isolations (in humans, mosquitoes, etc) and weather conditions. Risk levels served as a relative measure of the likelihood of an outbreak of human disease and are updated weekly based on that week's surveillance data. Initial and final WNV risk levels from the 2011 season are provided in the following maps. This information will be used to help predict risk in 2012, and will be revised as 2012 surveillance data are collected.

Initial and Final 2011 WNV Risk Categories

(As described in Table1 of the 2011 MDPH Arbovirus Surveillance and Response Plan which can be found at www.mass.gov/dph under "Information for Local Boards of Health")





EASTERN EQUINE ENCEPHALITIS (EEE) VIRUS

Birds

Birds are not routinely tested for EEE virus in Massachusetts because the results do not provide useful information on the level of human risk. Exotic bird flocks, comprised of species such as emus or exotic quail, may experience sudden illness and mortality due to EEE. Flocks showing these signs should be reported promptly to the Massachusetts Department of Agricultural Resources (MDAR).

Mosquito Samples

Eighty of 4604 (1.7%) mosquito samples collected in Massachusetts were positive for EEE virus in 2011. They were collected from 17 towns in 5 counties. Positive EEE virus mosquito samples included 58 *Culiseta melanura*, 8 *Coquillettidia perturbans, 4 Ochlerotatus canadensis, 2 Aedes vexans, 5 Culex pipiens/restuans; and 3 Culex* species. *Culiseta melanura* feeds almost exclusively on birds and is the primary enzootic vector of EEE virus. *Coquillettidia perturbans, Ochlerotatus canadensis, and Aedes vexans* species are aggressive mammal-biting mosquitoes and can be involved in the transmission of both WNV and EEE virus to humans in Massachusetts. For a complete list of positive mosquito samples by city/town, please see the annual Cumulative Mosquito Summary by County and Municipality report.

Animals

One horse tested positive for EEE in 2011. This horse was stabled in Worcester County, had an illness onset of 10/20/2011 and was not vaccinated against EEE.

Humans

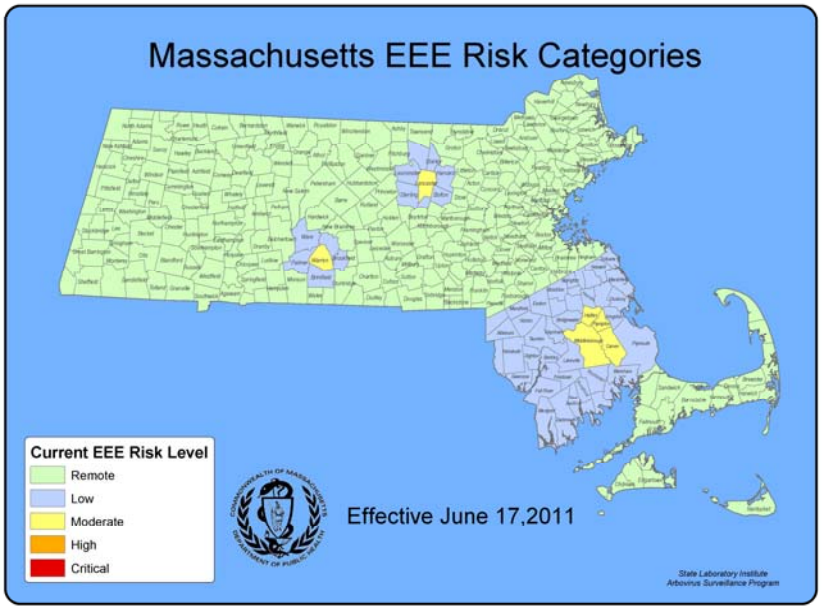
One fatal human case of EEE infection was identified in a Bristol County resident aged 60 years or older, with an onset date of 8/27/2011 and a clinical presentation of meningoencephalitis. A case was also identified in a Missouri resident aged 60 years or older, with an onset date of 8/25/2011 and a clinical presentation of encephalitis. An epidemiologic investigation determined that this individual was most likely exposed in Southeastern Massachusetts.

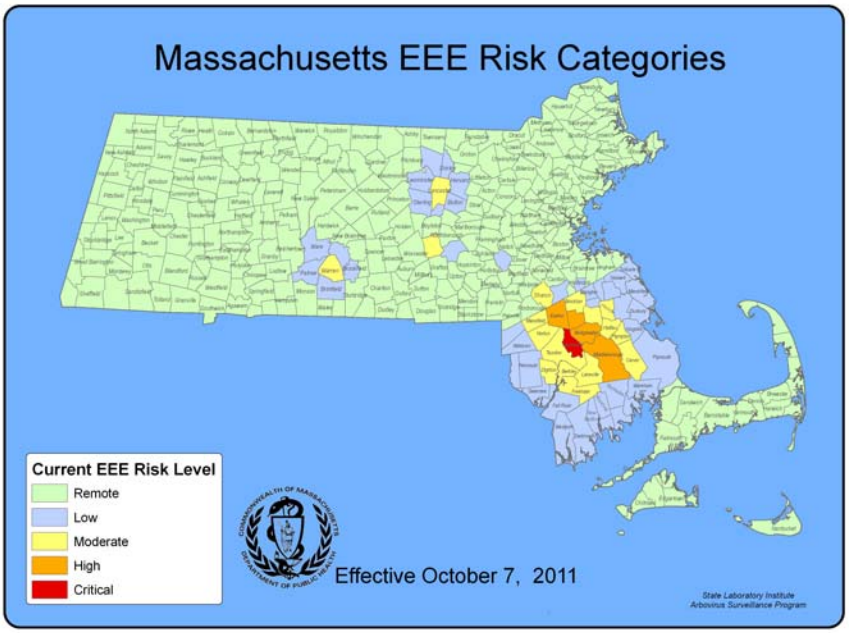
EEE Geographic Risk Levels

Arbovirus risk maps are produced by integrating historical data and areas of mosquito habitat with current data on positive virus isolations (in humans, mosquitoes, etc) and weather conditions. Risk levels served as a relative measure of the likelihood of an outbreak of human disease and are updated weekly based on that week's surveillance data. Initial and final EEE risk levels from the 2011 season are provided in the following maps. This information will be used to help predict risk in 2012, and will be revised as 2012 surveillance data are collected

Initial and Final 2011 EEE Risk Categories

(As described in Table 2 of the 2011 MDPH Arbovirus Surveillance and Response Plan which can be found at www.mass.gov/dph under "Information for Local Boards of Health")





COMBINED GEOGRAPHIC RISK LEVELS

Starting in 2011, risk information for both EEE and WNV (as described in this surveillance summary) was combined into one, "Mosquito-borne Illness Risk Map", which was regularly updated and made available to the public. This combined risk map was created in an effort to inform individuals more clearly about overall risk of mosquito-borne illness in Massachusetts. Initial and final combined risk levels from the 2011 season are provided in the following maps.

Initial and Final 2011 combined WNV and EEE Risk Categories

(As described in Tables 1 and 2 of the 2011 MDPH Arbovirus Surveillance and Response Plan which can be found at www.mass.gov/dph under "Information for Local Boards of Health")