


NEW JERSEY
DEPARTMENT OF AGRICULTURE


# NEW JERSEY VECTOR SURVEILLANCE

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**ABSTRACT:** New Jersey experienced a relatively wet spring in 1993 and early populations of *Culiseta melanura* were somewhat above average at the study sites that are being monitored for eastern equine encephalitis virus (EEE). The month of June, however, was relatively dry and *Cs. melanura* populations declined steadily at most of the sites. There has been no indication of EEE in the specimens tested to date, however, virus does not normally appear in mosquito specimens until July or early August at the sites we monitor in New Jersey.

## INTRODUCTION

The New Jersey Vector Surveillance Program is a cooperative program designed to monitor eastern equine encephalitis virus (EEE) and its mosquito vectors. The program is entering its 18th year and relies on information that is provided by a variety of state and county agencies. The NJ Agricultural Experiment Station conducts the actual field work in cooperation with county mosquito control agencies. Funding, testing services and important factual information regarding EEE is provided by the NJ State Departments of Health, Agriculture and Environmental Protection & Energy.

The program's objective is to monitor EEE virus in the southern portion of New Jersey and provide mosquito control agencies with current information on the status of the virus. In 1993, the program is cooperating with Dr. Bruce Webb of the Department of Entomology at Rutgers University to evaluate the efficiency of PCR technology in the rapid identification of virus in mosquitoes, birds and other vertebrates.

## METHODOLOGY OF THE SURVEILLANCE EFFORT

As in the past, *Cs. melanura* is being used as the main indicator of EEE virus. Specimens will be collected twice weekly from a line of resting boxes that are placed in areas of the state that have a history of either human or equine involvement. In most cases, the boxes are placed in stands of White Pine, a resting habitat that is particularly attractive to *Cs. melanura.* In areas where White Pine habitat is not available, the boxes monitor stands of Red Maple, an alternate habitat for *Cs. melanura* in southern New Jersey.

The resting box collection sites for 1993 are shown in Fig. 1. A brief description of each site follows:

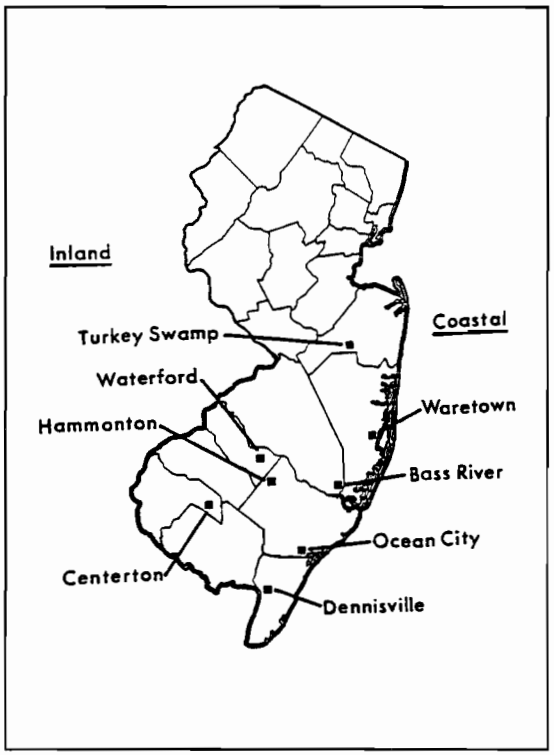


**Fig. 1. Resting box sites for arbovirus surveillance in 1993.**

COASTAL SITES

**Waretown, Ocean Co.**

The Waretown collection site is located in a mature White Pine plantation in a coastal region of Ocean Co. several miles south of Forked River, NJ. The Forked River area had a long history of EEE in penned pheasants and intense epizootic activity appears to occur in that region on a sporadic basis. The Waretown collection site was established in 1992, thus limited information is available on the annual dynamics of virus cycling in the area.

**Bass River, Burlington Co.**

The Bass River collection site is located in a plantation of Black, Red and White Pine within the Bass River State Forest near New Gretna, NJ. The area has served as a useful monitor for the coastal region north of Atlantic City since the encephalitis outbreak New Jersey experienced in 1959. The area is characterized by a series of dense Atlantic White Cedar bogs that border much of the salt marsh habitat along the Mullica River drainage. The area has been monitored for EEE since 1978 and considerable information is available on the dynamics of the *Culiseta melanura* populations in the vicinity.

**Ocean City (Corbin City), Atlantic Co.**

The Ocean City collection site was established in 1984 following 2 known human cases of EEE that were purportedly contracted in that area. The site was originally designed to monitor virus activity in the Ocean City area of Cape May Co. but the resting boxes are actually located in Corbin City, Atlantic Co. The area encompasses a mixture of Red Maple and Atlantic White Cedar that borders the salt marshes along the Tuckahoe River drainage. The Atlantic Co. Mosquito Control Unit makes all of the collections from this series of resting boxes and coordinates with the Vector Surveillance team to assure that the specimens are processed on schedule.

**Dennisville, Cape May Co.**

The Dennisville collection site is located in a Hemlock stand within the Belleplain State Forest near Dennisville, NJ and serves as a virus monitoring station for the salt hay farming region along Delaware Bay. The study site is located on a peninsula of upland forest that protrudes onto the salt marshes that dominate that area of the state. An extensive Atlantic White Cedar swamp borders the collection site and produces the largest *Cs. melanura* populations in the state. The Cape May Co. Mosquito Control Commission assists the Vector Surveillance Program whenever possible and regularly provides additional mosquito collections for virus assay.

INLAND SITES

**Turkey Swamp, Monmouth Co.**

The Turkey Swamp collection site was established in 1992 to monitor *Cs. melanura* in an area of the state where EEE virus appears on a sporadic basis. The area experienced a documented equine epizootic in 1983 and another in 1990. Results to date suggest that *Cs. melanura* populations are high during epizootic periods and are minimal in inter epizootic years. The current monitor is designed to determine

the minimum levels of *Cs. melanura* necessary to initiate epizootic activity. The resting boxes are currently being monitored in an area composed of mixed pine and hardwood forest vegetation.

**Waterford, Camden Co.**

The Waterford collection site is located in a mature White Pine plantation near the town of Waterford Works in Camden Co. The study site was established in response to an abrupt equine epizootic that took place in 1990. Data from 1991 and 1992 indicate that sizable *Cs. melanura* populations emanate from the upper reaches of the Great Egg Harbor River and its tributaries. In all probability, *Coquillettidia perturbans* functions as the vector to horses in this area, but the hypothesis has not been backed up with virus isolations from that species.

**Hammonton, Atlantic Co.**

The Hammonton collection site is located in a dense Red Maple swamp in Hammonton Township within the farm belt that is characteristic of the inner coastal plain of New Jersey. The study site was established in 1986 to investigate the repeated occurrence of equine deaths in western Atlantic Co. Collections from that area indicate that *Cs. melanura* populations frequently reach an early season peak and that early season epiornitic activity is common. We have limited data on the dynamics of the late season transmission that characterized the pattern of equine involvement prior to establishment of this site.

**Centerton, Salem Co.**

The Centerton collection site is located in a small stand of White Pine within Parvin State Park in northwestern Salem Co. The site was established in 1985 to investigate the dynamics of virus activity on the inner coastal plain. The area includes a combination of Atlantic White Cedar and Red Maple habitat that is surrounded by rural farm land. *Culiseta melanura* populations (and equine cases of EEE) appear to peak in this area during years of excessive rainfall.

**Table 1. *Cs. melanura* submitted for virus assay during the month of June, 1992.**

| LOCATION | TOTAL TESTED | NO. POOLS | POSITIVE EEE | MFIR VALUE |
|---|---|---|---|---|
| Coastal Sites | | | | |
| Waretown | 53 | 9 | 0 | 0 |
| Bass River | 258 | 13 | 0 | 0 |
| Ocean City | 88 | 9 | 0 | 0 |
| Dennisville | 134 | 6 | 0 | 0 |
| Inland Sites | | | | |
| Turkey Swamp | 38 | 9 | 0 | 0 |
| Waterford | 145 | 9 | 0 | 0 |
| Hammonton | 81 | 3 | 0 | 0 |
| Centerton | 104 | 6 | 0 | 0 |

## THE CURRENT STATUS OF EEE AND ITS MOSQUITO VECTORS IN NEW JERSEY

New Jersey experienced a fairly wet spring this year and water tables were higher than average in most areas of the state at the start of the mosquito season. Populations of early season *Aedes* were extremely high in most counties and summer flood water mosquitoes appeared nearly a month earlier than usual. *Culiseta melanura* populations followed the general trend with higher than average numbers during the earliest part of the spring season. Dry conditions followed during the month of June, however, and *Cs. melanura* populations declined steadily as the month advanced. Many

of the study sites that were being monitored showed an increase in *Cs. melanura* during the last week of June, but the extremely hot and dry weather that followed severely reduced the numbers of mosquitoes available for processing toward the very end of the month.

During the month of June, 901 *Cs. melanura* were tested for virus with no indication of EEE. Table 1 gives the totals by collection site for the month.


## ACKNOWLEDGMENTS

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