



NEW JERSEY
DEPARTMENT OF AGRICULTURE



NEW JERSEY VECTOR SURVEILLANCE

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ABSTRACT: New Jersey experienced a relatively dry spring in 1992 and early populations of *Culiseta melanura* were below average at the study sites that are being monitored for eastern equine encephalitis virus (EEE). The latter portion of June did produce significant rainfall but, to date, *Cs. melanura* populations have not responded to the increased breeding habitat. The early portion of July returned to near drought conditions, suggesting that *Cs. melanura* populations would probably remain low until the normal August increase. 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 to monitor eastern equine encephalitis virus (EEE) is entering its 17th year. The program was originally established in 1976 to provide information on EEE during New Jersey's bicentennial year. The study has since expanded into an ongoing cooperative effort that includes input from the NJ. State Departments of Health, Agriculture and Environmental Protection & Energy.

The program's main objective is to monitor EEE virus throughout the mosquito season and provide mosquito control agencies in the state with current information on the status of the virus. A sizable data base has been accumulated over the years and the information is being evaluated to produce a prediction model for EEE at coastal and inland sites.

METHODOLOGY OF THE SURVEILLANCE EFFORT

As in the past, *Cs. melanura* will be used as the main indicator of EEE virus. Specimens will be collected once weekly from a line of at least 25 resting boxes that are placed in areas of the state that have a history of either human or equine involvement. Whenever possible, the boxes are placed in mature 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 are placed in dense stands of Red Maple.

The resting box collection sites for 1992 are shown in Fig. 1. A brief description of each site follows:

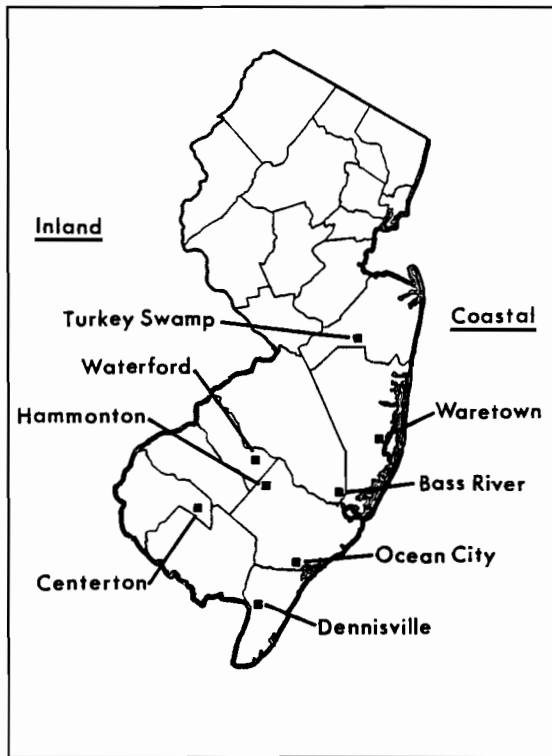


Fig. 1. Resting box sites for arbovirus surveillance in 1992.

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 collection site is new this year, thus, no information is available on the status of *Cs. melanura* in the vicinity.

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 and serves as a monitor for the coastal region just north of Atlantic City. The New Gretna area was one of the centers for human involvement during the outbreak of 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 data is available on the *Culiseta melanura* populations in the vicinity.

Ocean City (Corbin City), Atlantic Co.

The Ocean City collection site was established in 1984 following the 2nd known human case of EEE reported from that area. Although the site monitors virus activity in the Ocean City area of Cape May Co., the resting boxes are located near Corbin City in 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 White Pine plantation 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 vast salt marsh habitat in that area. An extensive Atlantic White Cedar swamp borders the entire area and produces the largest *Cs. melanura* populations in the state. The Cape May Co. Mosquito Control Commission is currently supporting a research study on salt marsh wading birds in the region and their role in the epidemiology of EEE. The Dennisville site has been monitored since 1976 and has proven to be a reliable indicator for virus activity over the entire Delaware Bay region.

INLAND SITES

Turkey Swamp, Monmouth Co.

A Monmouth Co. collection site was introduced last year in response to equine cases in the area but *Cs. melanura* populations proved to be extremely low in 1991. As a result, the study site was moved several times and little information was gained on the status of virus in that area. In the early portion of the 1992

season, the resting boxes were placed in an area known as Turkey Swamp, a Fish & Wildlife Management area composed primarily of mixed pine and hardwood forest. Dwindling *Cs. melanura* populations prompted placement of a second set of boxes closer to Freehold in a drained stand of Atlantic White Cedar that is slowly being replaced by hardwood vegetation. Both sites will be monitored with the hope that one will prove adequate for surveillance purposes.

Waterford, Camden Co.

The Waterford collection site is located in a White Pine plantation near the town of Waterford Works in Camden Co. The study site was established last year in response to a series of equine cases in the vicinity during 1990. Data from 1991 indicate that sizable *Cs. melanura* populations are present in the area .

Hammonton, Atlantic Co.

The Hammonton collection site is located in a sizable 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 in response to 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 epizootic activity is common.

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 as a first attempt to investigate the dynamics of early season 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	24	7	0	0
Bass River	349	13	0	0
Ocean City	50	9	0	0
Dennisville	377	12	0	0
Inland Sites				
Turkey Swamp	5	2	0	0
Waterford	168	9	0	0
Hammonton	189	10	0	0
Centerton	89	9	0	0

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

New Jersey experienced a relatively dry spring this year and water tables were lower than average in most areas at the start of the

mosquito season. Populations of snow pool and flood water mosquitoes did not reach their normal peaks and mosquito annoyance, in general, was greatly reduced throughout the state. *Culiseta melanura* populations followed the general trend with reduced numbers in most

areas during the early spring. The months of May and June were characterized by unseasonably cool weather which may have further lowered the number of specimens willing to enter the artificial resting containers. Precipitation did occur in the latter portion of June but there was no noticeable increase in the *Cs. melanura* populations.

During the month of June, 1251 *Cs. melanura* were tested for virus with no indication of EEE. Table 1 gives the totals by collection site for the month. The low totals that have been submitted for virus isolation attempts reflect the weather conditions that New Jersey has experienced this year. Under normal circumstances, the spring sample should total more than twice that amount

EEE virus does not normally appear in mosquitoes until July at the earliest and in many years the virus is not evident in mosquitoes until mid-August. The data gathered to date, however, indicate that conditions for amplification of EEE are unfavorable and will remain so until the *Cs. melanura* populations increase.

ACKNOWLEDGMENTS

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Prepared by: Dr. Wayne J. Crans
Mosquito Research & Control, Cook College
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