

Arbovirus Surveillance

This arbovirus season has demonstrated the effectiveness of the Arbovirus Sentinel Program in preventing human disease. In early July we reported an increase in the number of sentinels seroconverting to St. Louis Encephalitis. On July 28 the Bureau of Epidemiology, in response to our reports of continued elevated seroconversion rates issued a Medical Alert which grew to encompass 27 counties. The alert was not lifted until December 12, when sentinel seroconversion rates decreased substantially. Because of this immediate reaction, which led to a major public health education outreach for protection from mosquito bites and increased targeted pesticide application, only 9 human cases of encephalitis due to St. Louis Encephalitis virus were detected. This compares with over 100 human cases in 1990, when the response to sentinel data was slow in starting.

The sentinel chicken program is a cost effective way to stay on top of the situation. Last year 22 counties participated in this project. Mosquito control agencies or County Public Health Units within participating counties maintained small flocks of chickens at various sites in their area. The birds were bled at specified intervals, and the samples sent to our laboratory. All specimens received in the lab by 12 noon on Wednesday were processed and assayed in that week's test. The hemagglutination inhibition test (HAI) was used to ascertain the presence of antibody to SLE and EEE viruses. Reports were expeditiously faxed to the submitters on Friday afternoon. Summary reports were also compiled and sent to the County Health Department Directors for all participating counties. During the period of the medical alert, a weekly conference call under the direction of the Bureau of Epidemiology was held each Friday afternoon to discuss the clinical and sentinel data for the week.

Arbovirus related studies once again comprised a major portion of the 1997 virology workload. Figures 2 & 3 depict monthly positive sentinels since 1988, for EEE and SLE respectively.

Of the 67 counties in Florida, 22 submitted sera for arbovirus surveillance last season. Degree of participation varied amongst them. Figures 4, 5, 6, 7, and 8 show, respectively, for each county, the numbers of surveillance sites maintained, the total number of susceptible chickens exposed during 1997, the number of serum samples which were submitted from exposed birds, the number of sentinel birds which seroconverted to EEE during 1997, and the number of birds which seroconverted to SLE during 1997. There are substantial areas of the state which are not monitored. Sampling is clustered, and hence, the distribution of virus activity

appears clustered. It would be of value for our understanding and future control of arbovirus outbreaks, if these currently underrepresented areas of the state could be encouraged to continue participation in surveillance activities.

Table 6a provides a listing of the counties which participated during 1997, the numbers of sites and birds they maintained, the number of sera they submitted, the numbers of sentinels which seroconverted to EEE and SLE, the percent of exposed birds which seroconverted.

Seroconversion dates are given in table 6b; confirmed seroconversions are indicated by "*"; presumptives are listed when a second (confirming) serum was not provided from that bird. Except from the Panhandle area, SLE activity was elevated in all counties submitting sera; annual seroconversion rates were significantly above each regional historical mean. Annual rates for EEE were elevated above the historical mean annual rates for their region of the state for Bay, Leon, Flagler and St. Johns counties. Figures 9 and 10 depict the seroconversions to EEE and SLE, respectively, by month, for the four state regions. SLE activity peaked in October, and was elevated above the historical means each month from June through December. EEE activity peaked in July, but was not significantly above historical means all year.

A total of 39,864 HAI tests were performed for arbovirus studies. This includes both the sentinel flock incidence studies, and wild bird sera submitted for prevalence studies. There were 1367 positive tests for SLE and 190 for EEE. The prevalence study samplings were in conjunction with Dr. Jonathon Day (FMEL), and were submitted for identification of major wild amplification and overwintering hosts of these agents in nature. This aids in our understanding of the natural history of these agents, thus leading to the development of early warning systems and possible outbreak control. Non-governmental organizations which submitted sera for HAI testing were billed \$12,106 for such services in 1997.

Additional related arbovirus studies included 170 serum neutralization tests to detect the presence of SLE and EEE antibody in avian sera. There were 25 sera positive for EEE (126 assays) and 9 positive for SLE (44 assays). Other assays in this series have been delayed because of the staff shortage.

Figure 2.

EEE SEROCONVERSIONS BY MONTH FROM 1988-1997

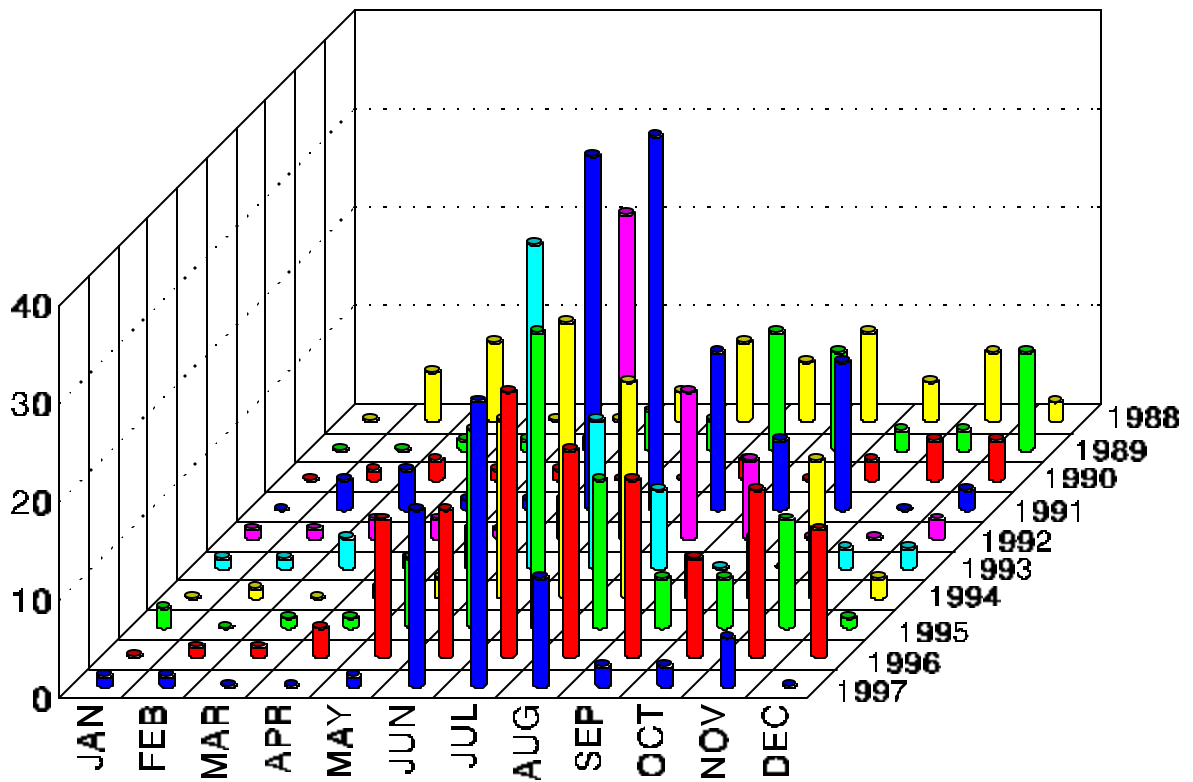


Figure 3.

SLE SEROCONVERSIONS BY MONTH FROM 1988-1997

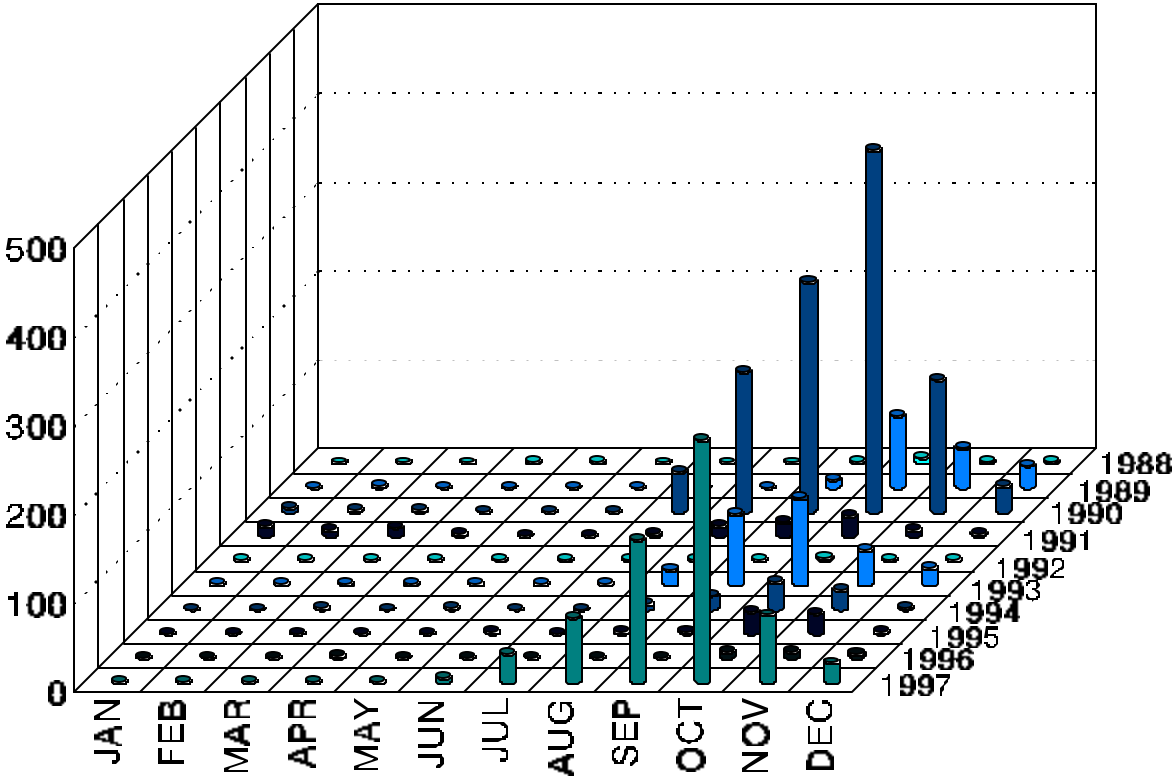


Figure 4.

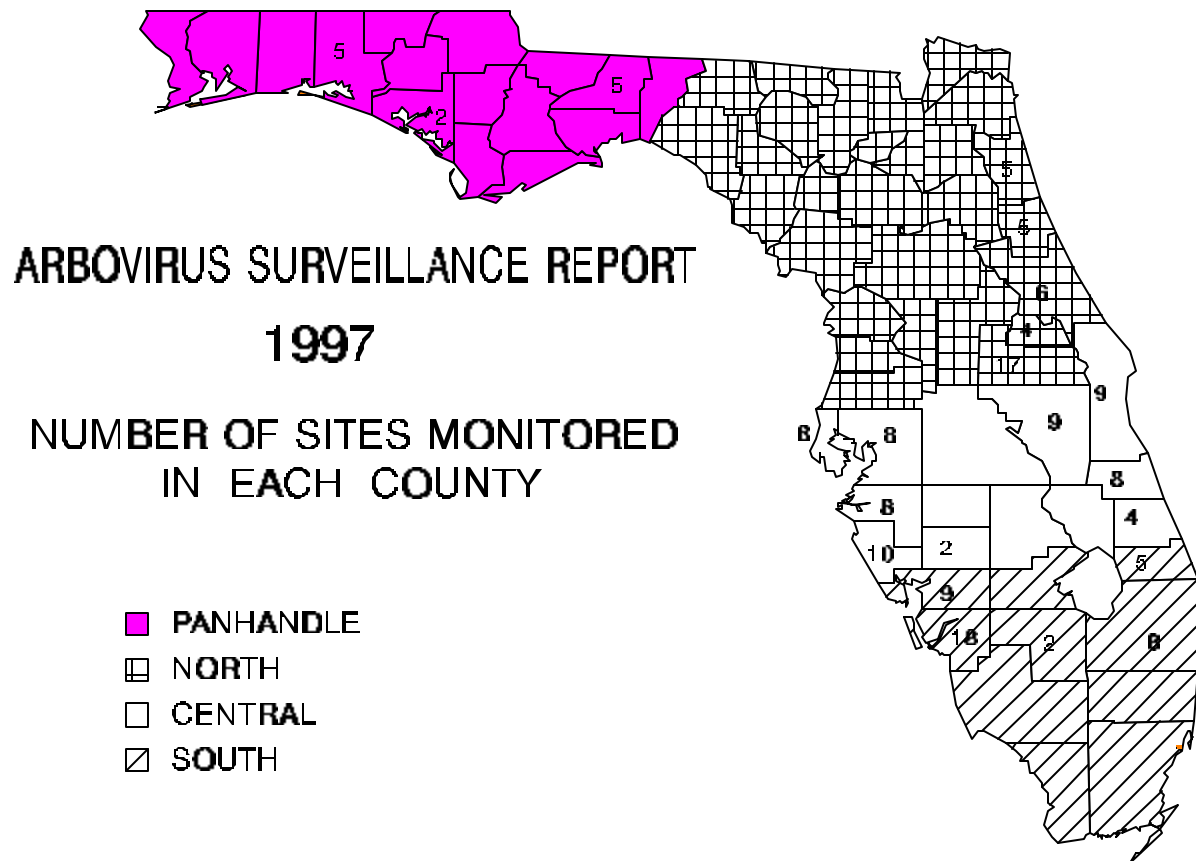


Figure 5.

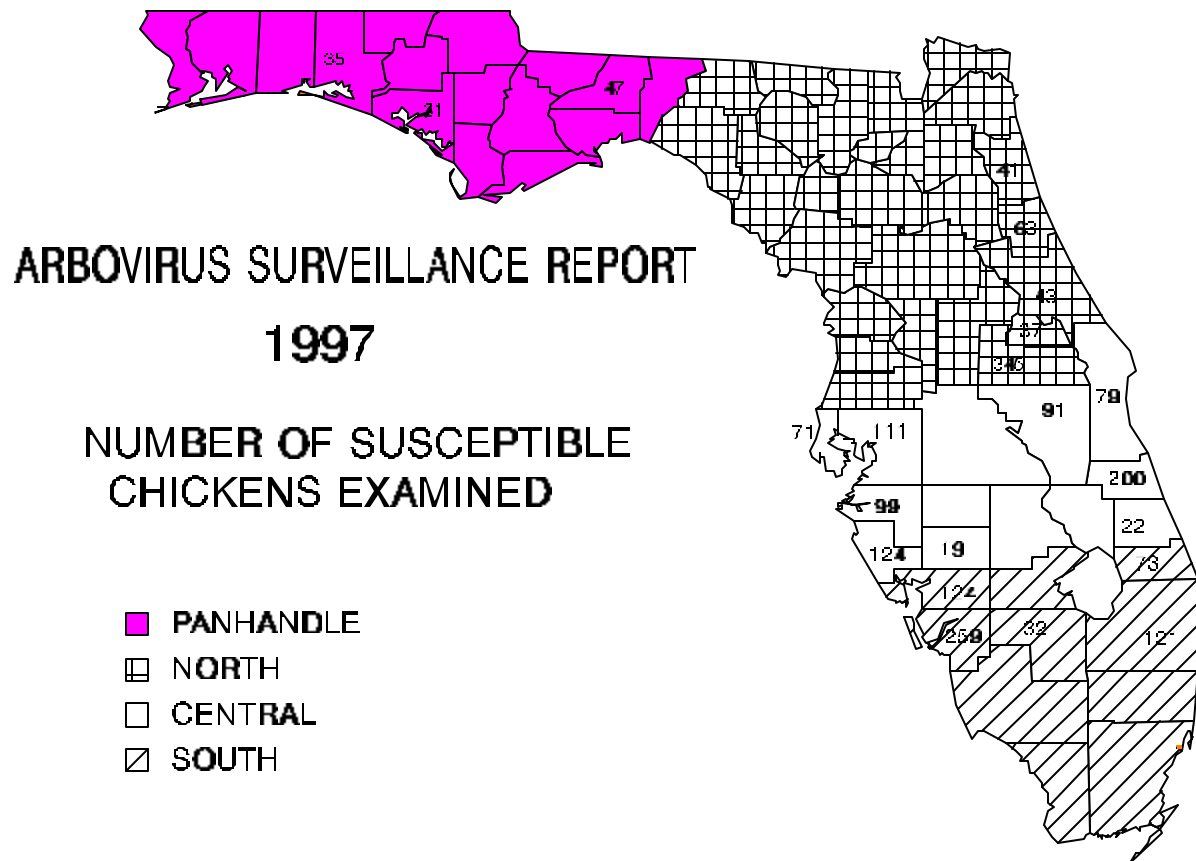


Figure 6.

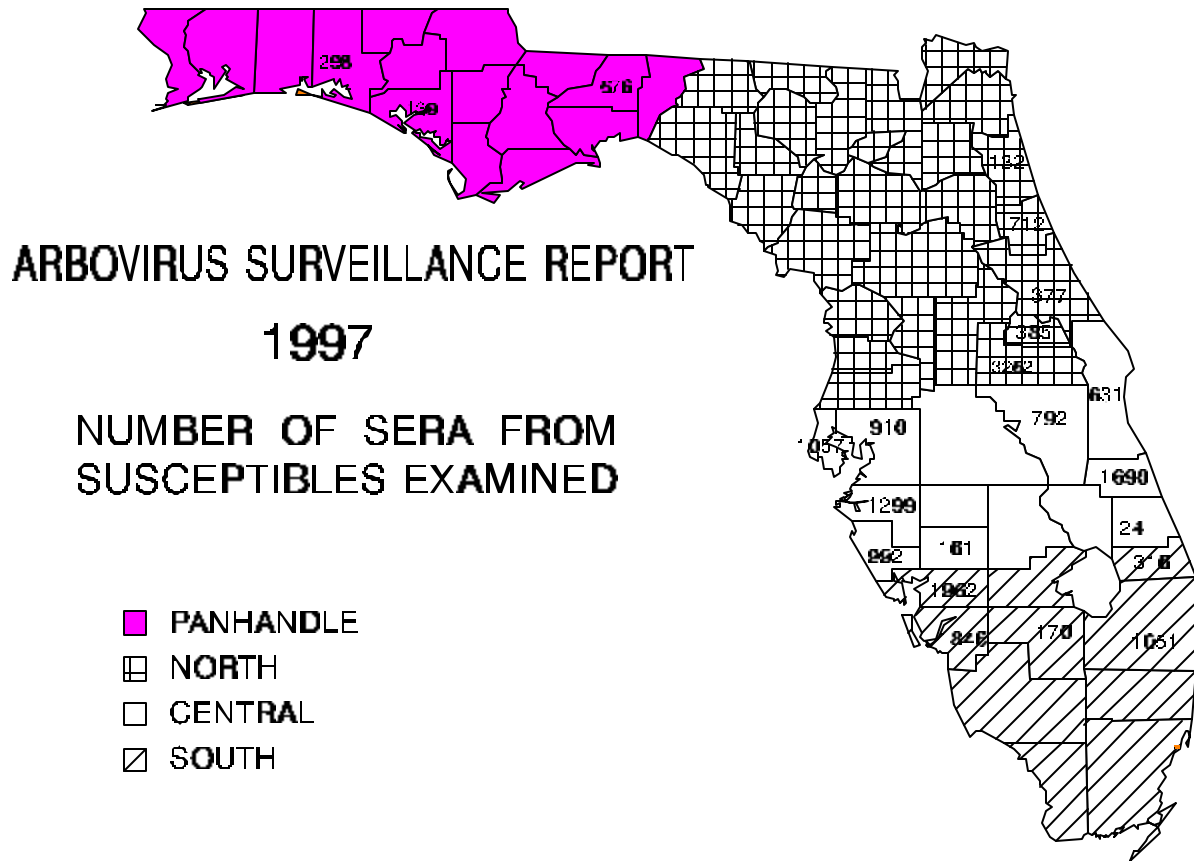


Figure 7.

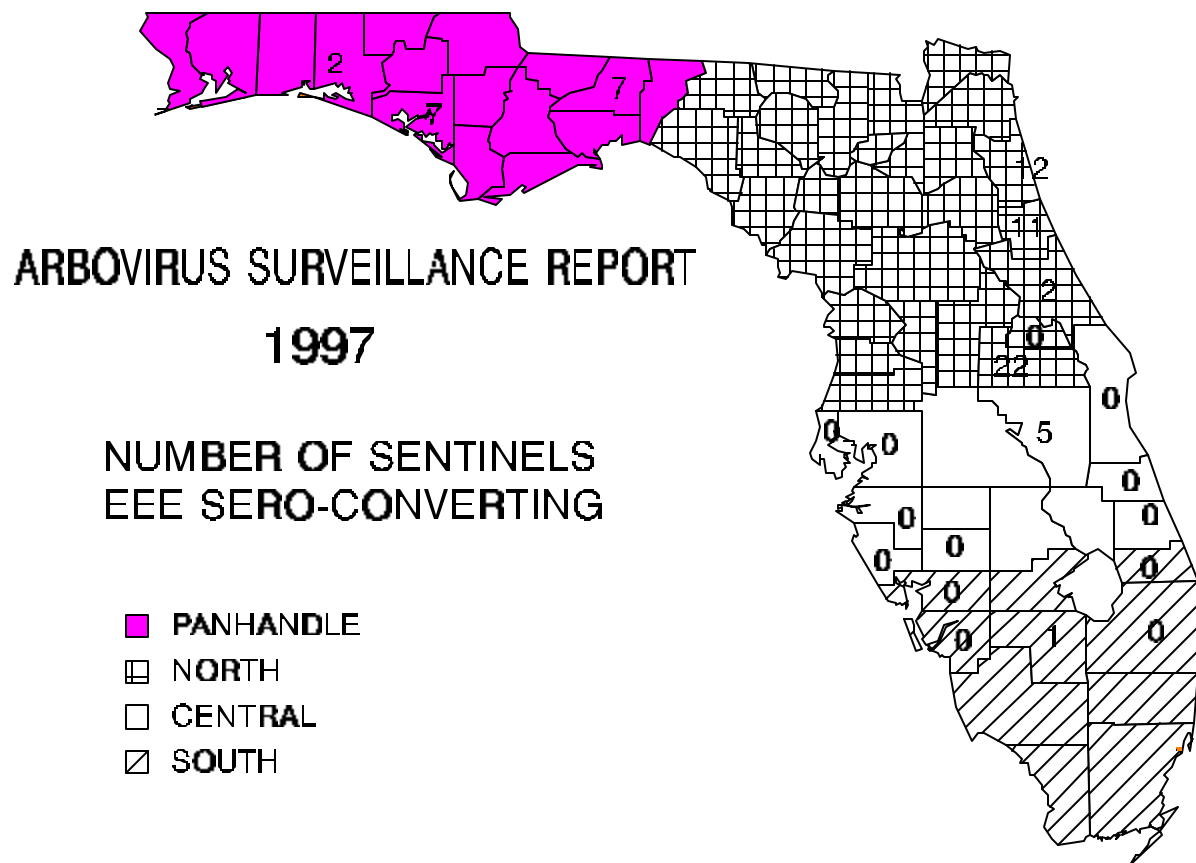


Figure 8.

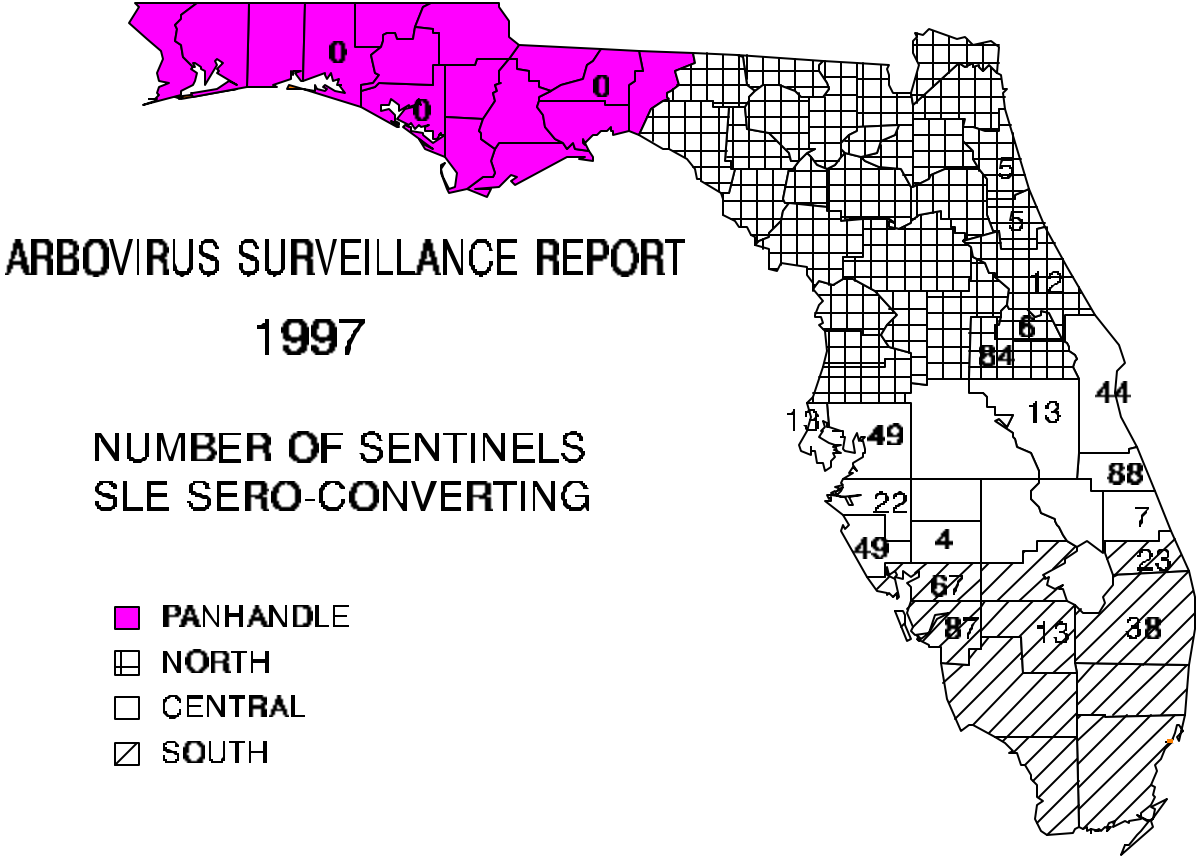


Table 6a. ARBOVIRUS SURVEILLANCE REPORT: Sentinel flock activity by county-

County	# of Sites Monitored	# of Suscept. Examined	# of Sera From Suscept	# of Sentinels Sero Converting		Percent of Sero Conversion	
				EEE	SLE	EEE	SLE
Bay	2	21	139	7	0	33.3%	0.0%
Brevard	9	79	631	0	44	0.0%	55.7%
Charlotte	9	124	1962	0	67	0.0%	54.0%
Desoto	2	19	147	0	4	0.0%	21.1%
Flagler	5	63	712	11	5	17.5%	7.9%
Hendry	2	32	170	1	13	3.1%	40.6%
Hillsborough	8	111	910	0	49	0.0%	44.1%
Indian River	8	200	1690	0	88	0.0%	44.0%
Lee	18	259	1846	0	87	0.0%	33.6%
Leon	5	47	676	7	0	14.9%	0.0%
Manatee	8	99	1299	0	22	0.0%	22.2%
Martin	5	73	316	0	23	0.0%	31.5%
Orange	17	345	3262	22	84	6.4%	24.3%
Osceola	9	91	792	5	18	5.5%	19.8%
Palm Beach	8	121	1051	0	38	0.0%	31.4%
Pinellas	8	71	1057	0	13	0.0%	18.3%
Sarasota	10	124	992	0	49	0.0%	39.5%
Seminole	4	37	385	0	6	0.0%	16.2%
St.. Johns	5	41	132	12	5	29.3%	12.2%
St. Lucie	4	22	24	0	7	0.0%	31.8%
Volusia	6	43	377	2	12	4.7%	27.9%
South Walton	5	35	298	2	0	5.7%	0.0%
Totals	157	2057	18868	69	634		

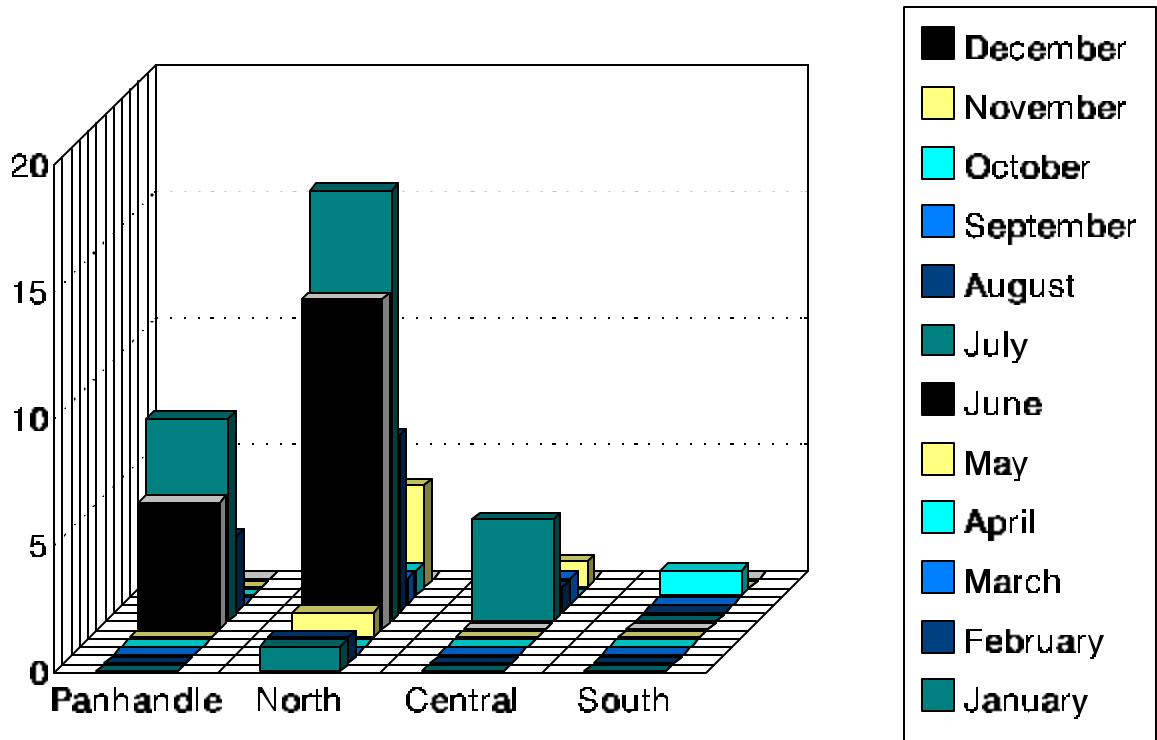
Table 6b. ARBOVIRUS SURVEILLANCE REPORT: Sentinel flock activity by county

County	Week of Sero Conversion (* Indicates Confirmed)
Bay	EEE: 6/17(5*), 7/29(1), 8/12(1*)
Brevard	SLE: 6/26(1*), 7/17(2*), 7/24(1*), 8/7(1*), 8/15(2*), 8/21(1*), 8/22(1*), 9/5(1*), 9/11(1*), 9/12(1*), 9/18(4*), 9/19(2*), 9/26(3*), 9/29(1*), 10/2(2*), 10/3(2*), 10/9(3*), 10/10(3*), 10/16(3*), 10/17(1*), 10/27(3*), 10/30(1*), 10/31(1*), 11/7(3*)
Charlotte	SLE: 7/11(1*), 8/15(1*), 8/22(1*), 8/29(3*), 9/5(3*), 9/12(8*), 9/19(9*), 9/26(15*), 10/3(11*,1), 10/10(5*), 10/17(1*), 10/24(1*), 10/31(3*), 11/14(3*), 12/19(1)
Desoto	SLE: 10/28(1*,1), 11/3(1*,1)
Flagler	EEE: 5/27(1*), 6/9(1*), 6/23(3*), 6/30(1*), 7/7(1), 7/21(1*), 8/4(1*), 11/3(1*), 11/17(1*); SLE: 10/6(1*), 10/27(1*), 11/3(2*), 11/10(1*)
Hendry	EEE: 10/6(1*); SLE: 7/14(1*), 7/28(1*), 8/11(1*), 8/18(1*), 8/25(3*,1), 9/22(2*), 10/20(1*), 10/27(1*), 11/3(1*)
Hillsborough	SLE: 8/25(1*), 9/8(1*), 9/15(2*), 9/22(5*), 9/29(5*), 9/30(2*), 10/6(12*), 10/13(5*), 10/14(1), 10/20(1*), 10/27(6*), 11/3(3*), 11/10(1), 11/13(2), 11/17(1*), 12/1(1)
Indian River	SLE: 6/12(5*), 7/2(2*), 7/17(12*), 7/24(11*), 7/31(6*), 8/7(8*), 8/14(7*), 8/21(4*), 8/28(11*), 9/4(4*), 9/11(4*), 9/25(1*), 10/2(1*), 10/9(1*), 10/16(1*), 10/23(3*), 10/30(4*), 12/4(3*)
Lee	SLE: 8/18(2*), 8/25(1*), 8/26(2*), 9/1(4*,1), 9/2(5*), 9/8(2*), 9/9(3*,1), 9/15(2*), 9/16(1*), 9/22(4*,1), 9/23(2*), 9/29(4*,1), 10/6(22*,1), 10/13(5*), 10/14(5*,1), 10/20(1*), 10/27(6*), 11/4(4*), 11/10(1), 11/11(3*), 12/1(1*), 12/8(1)
Leon	EEE: 7/15(1*), 7/21(3*), 7/29(1*), 8/4(2*),
Manatee	SLE: 8/29(2*), 9/12(3*), 9/26(3*), 10/4(1*), 10/10(7*), 10/17(2*), 10/24(1*), 10/31(1*,1), 11/7(1*)
Martin	SLE: 8/11(1*), 8/25(2*), 9/2(1*), 9/11(4*), 9/17(5*), 9/29(2*), 10/13(2*), 10/20(3*), 10/27(1*), 11/10(2*)
Orange	EEE: 1/23(1*), 2/7(1*), 5/9(1*), 6/6(1*), 6/13(3*), 6/20(1*), 7/3(1*), 7/7(2*), 7/14(1*,1), 7/17(2*), 7/21(1*), 7/24(2*), 8/7(1*), 11/7(1*); SLE: 7/25(2*), 8/1(1*), 8/7(1*), 8/8(4*), 8/12(2*), 8/13(3*), 8/14(2*), 8/15(1*), 8/22(2*), 8/25(1*), 8/28(1*), 8/29(2*), 9/5(2*), 9/11(4*), 9/18(7*), 9/26(10*), 10/3(3*,1), 10/9(7*), 10/10(2*,1), 10/17(2*), 10/20(2*), 10/23(2*), 10/24(1*,1), 10/31(1*), 11/3(6*), 11/14(1*), 11/17(1*), 11/24(2*), 11/28(5*), 12/24(1*)
Osceola	EEE: 6/25(1*), 7/22(3*), 9/9(1*); SLE: 8/19(2*), 8/25(1*), 9/2(1*), 9/9(2*), 9/15(1*), 10/7(4*), 10/14(1*,1), 10/21(1*), 10/27(1*), 11/4(2*), 12/8(1)
Palm Beach	SLE: 8/18(3*), 9/2(1*), 9/8(2*), 9/15(2*), 9/22(4*), 9/29(6*), 10/6(3*), 10/13(5*), 10/20(1*), 11/3(2*), 11/10(1*), 11/17(2*), 12/1(4*), 12/8(1), 12/15(1)
Pinellas	SLE: 8/4(2*), 9/8(1*), 9/9(1*), 9/15(4*), 9/22(1*), 10/6(2*), 10/13(1*), 10/28(1*),
Sarasota	SLE: 8/25(2*), 9/2(1*), 9/8(4*), 9/15(3*), 9/22(3*), 9/29(6*), 10/6(3*,1), 10/13(10*), 10/20(9*), 10/27(3*), 11/9(2*), 11/18(1*), 11/25(1*)
Seminole	SLE: 9/3(1*), 9/17(1*), 10/1(2*), 11/12(1*), 11/19(1*)
St.. Johns	EEE: 6/20(2*,1), 7/17(1*), 7/18(2*), 7/31(1*), 8/7(2*), 8/14(2*), 9/4(1*), SLE: 9/4(1*), 9/19(1*), 9/30(1*), 10/10(1*), 10/24(1*)
St. Lucie	SLE: 8/26(1*), 9/10(2*), 9/17(3*), 10/22(1)
Volusia	EEE: 6/30(1*), 9/29(1*); SLE: 8/25(1*), 9/15(4*), 9/22(1*), 10/6(1), 10/13(3*), 11/12(1*), 11/19(1*),
South Walton	EEE: 7/28(2*)

Figure 9.

ARBOVIRUS SURVEILLANCE REPORT FOR FLORIDA

Number of EEE Sero-Conversions for 1997

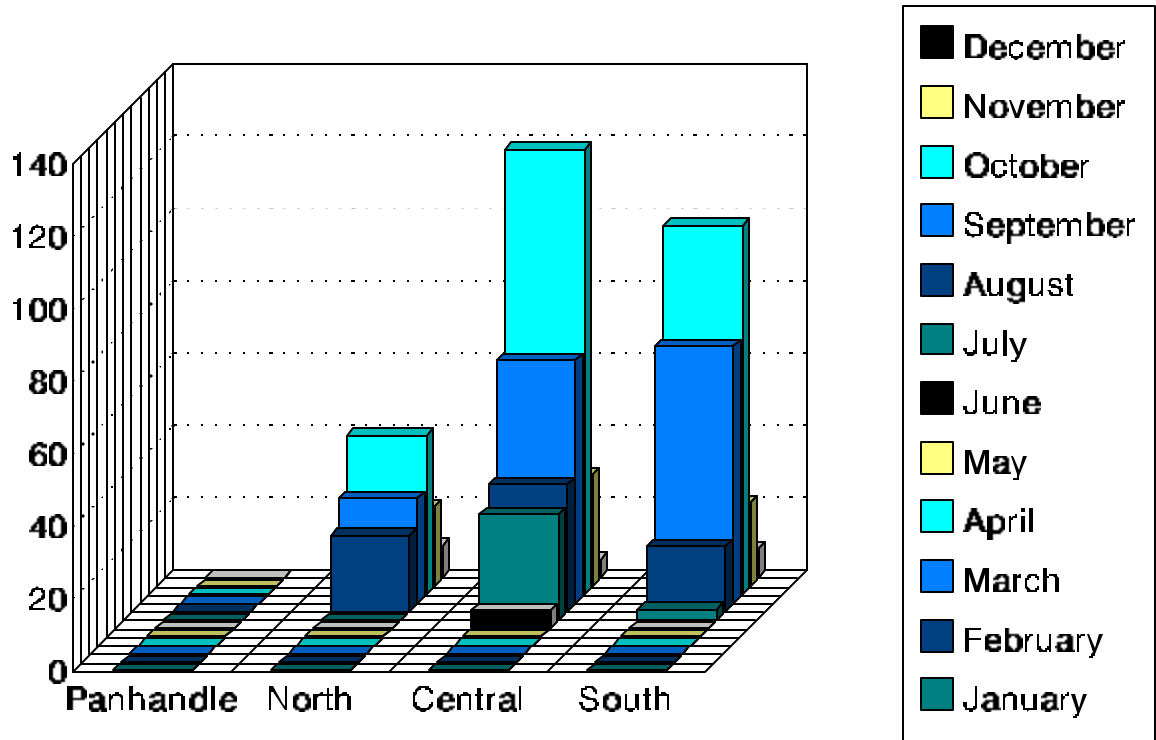


Sentinel Chicken Activity by Location

Figure 10.

ARBOVIRUS SURVEILLANCE REPORT FOR FLORIDA

Number of SLE Sero-Conversions for 1997



Sentinel Chicken Activity by Location