Southern Nevada Health District
2018 Mosquito Disease Surveillance – Activity Summary

In 2018, the Southern Nevada Health District's Mosquito Disease Surveillance program identified the lowest levels of arboviral activity in Clark County since 2010, when no arboviral activity was detected. No human cases of West Nile virus or St. Louis encephalitis were reported in 2018.

During April through September, staff set 2,010 traps, comprising of 1,219 Gravid (61%), 499 Bio-Gents (BG) Sentinel (25%), 278 Encephalitis Vector Surveillance (EVS) (14%) and 12 other types of traps. Staff continued surveillance for *Aedes aegypti*, which were first identified in 2017, however the invasive mosquito was not found in zip codes outside of the index area.

A total of 37,471 mosquitoes, comprising of 1,777 submission pools, were submitted to the Southern Nevada Public Health Laboratory (SNPHL) for West Nile virus (WNV), St. Louis encephalitis (SLE) and Western Equine encephalitis (WEE) analysis. From these samples only two submission pools, totaling 66 mosquitoes were positive for West Nile virus. Tables 1 and 2 detail the types and number of mosquito samples positive for arbovirus activity. Maps 1 – 6 show distribution and results of surveillance activities.

A significant development in 2018 was the Suthern Nevada Public Health Lab (SNPHL) developing arboviral testing capabilities and assuming arboviral testing responsibilities from the Nevada Department of Agriculture's Animal Disease Laboratory in Sparks, Nevada. SNPHL was an ideal site for mosquito arboviral testing, as it already performed high-complexity PCR assays in other surveillance functions and had the appropriate space, equipment, and trained staff available. The request to make testing "local" as opposed to shipping out of Clark County allowed SNPHL to transition to mosquito arboviral PCR testing for Zika virus, West Nile virus, St. Louis Encephalitis, and Western Equine Encephalitis in April of 2018. Testing and workflow processes in place required few changes, and once the volume of sample pools and pace of submissions were established, SNPHL was able to provide a significantly shorter turn-around-time from sorted pools to results over shipping samples to another jurisdiction. SNPHL participated in the national annual CDC Arboviral Proficiency testing panel and received a passing score of 100%.

Despite the low arboviral activity identified, the program made significant overall progress with academic and institutional stakeholders. The Centers for Disease Control and Prevention (CDC) article "Bloodmeal Host Selection of *Culex quinquefasciatus* (Diptera: Culicidae) In Las Vegas, Nevada United States" was published in the Journal of Medical Entomology[1]. Additionally, Yale University's Department of Ecology and Evolutionary Biology published a Scientific Note "Origin of *Aedes Aegypti* in Clark County, Nevada" in the Journal of American Mosquito Control Association[2].

Program staff presented information on the 2016 St. Louis encephalitis outbreak and/or the 2017 identification of *Aedes aegypti* at numerous annual conferences including the Mosquito and Vector Control Association (MVCAC), American Mosquito Control Association (AMCA), Utah Mosquito

Abatement District (UMAD), National Association of County & Health Officials Vector Control Summit (NACCHO), Council of State and Territorial Epidemiologists Vector Borne Disease Regional Meeting (CSTE), and the Nevada Vector Control Association.

Presenting on the identification of *Aedes aegypti* at NACCHO's Vector Control Summit led to another collaboration with the CDC's Arboviral Branch. A two-year project proposal was developed to establish a baseline population density of *Ae. aegypti* in the target community, determine what environmental factors are favorable to the mosquito in the North Las Vegas area where it is found, and to evaluate what control measures could work to eradicate the species from the area. The project was funded with the goal of being implemented during the 2019 and 2020 mosquito surveillance seasons.

Although no human cases of disease were reported, the Office of Epidemiology and Disease Surveillance (OEDS) conducted two WNV case investigations. Both were classified as out of jurisdiction, meaning the cases lived outside of Clark County and were reported by another jurisdiction. In addition, OEDS conducted 49 investigations into travel associated exposures to Zika virus. Of the 49 investigations for Zika virus, none were claimed as cases.

The Public Information Office continued its communications program to educate the public about West Nile illnesses and prevention measures. The Health District utilized social media, traditional news releases as well as media interviews. West Nile prevention messages, in both Spanish and English, were posted to the district's Twitter account and Facebook pages at least once per week between June and September and were repeated throughout the summer.

Table 1: Numerical Distribution of Traps Set, Mosquitoes Samples and Results

Jurisdiction	Mosquito Traps Set	Mosquitoes Tested	Mosquito Pools	WNV + Pools	SLEV + Pools
City of Las Vegas	642	15,518	626	1	0
Unincorporated Clark County	466	10,004	449	1	0
City of North Las Vegas	460	6,211	369	0	0
City of Henderson	344	4,531	250	0	0
Boulder City	45	247	24	0	0
City of Mesquite	32	269	35	0	0
Paiute Reservation	21	691	24	0	0
Total	**2010**	**37,471**	**1,777**	**2**	**0**

Table 2: Arbovirus Positive Mosquito Species and Counts

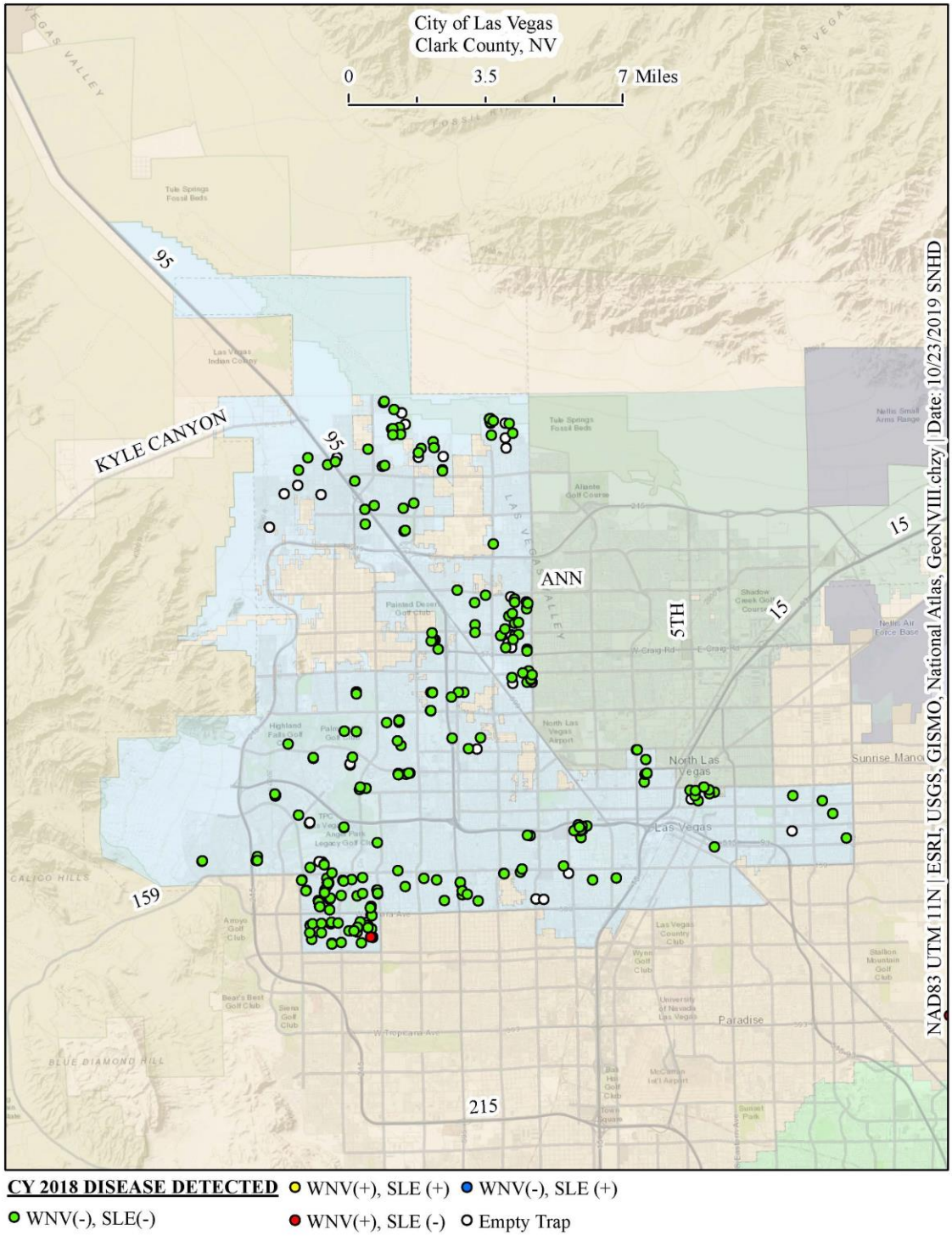
Mosquito Species	# of WNV + Pools	# of Mosquitoes in WNV + Pools	# of SLEV + Pools	# of Mosquitoes in SLEV + Pools
Cx. quinquefasciatus	16	1	0	0
Cx. erythrothorax	50	1	0	0
Total	**66**	**2**	**0**	**0**

References:

1. Hannon, E. et al. 2019. Bloodmeal Host Selection of Culex quinquefasciatus (Diptera: Culicidae) in Las Vegas, Nevada, United States. Journal of Medical Entomology, 56(3):603-608
2. Pless E, Raman V. 2018. Origin of Aedes aegypti in Clark County, Nevada. *Journal of the American Mosquito Control Association*, 34(4):302-305

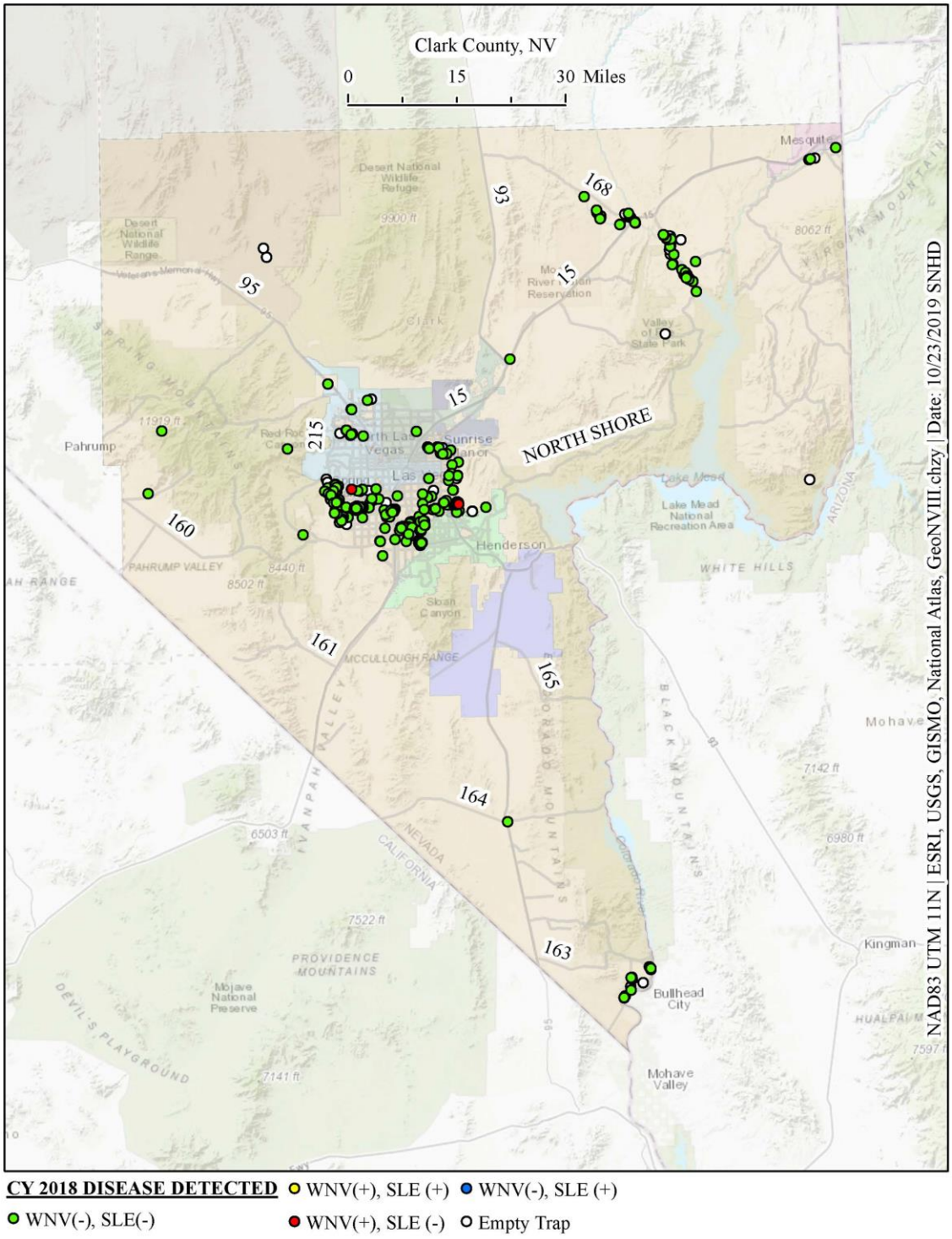
Map 1: City of Las Vegas - Surveillance Distribution and Results

Traps	Mosquitoes Tested	Mosquito Pools Tested	WNV + Mosquito Pools	# of Mosquitoes in WNV + Pools
642	15,518	626	1	16



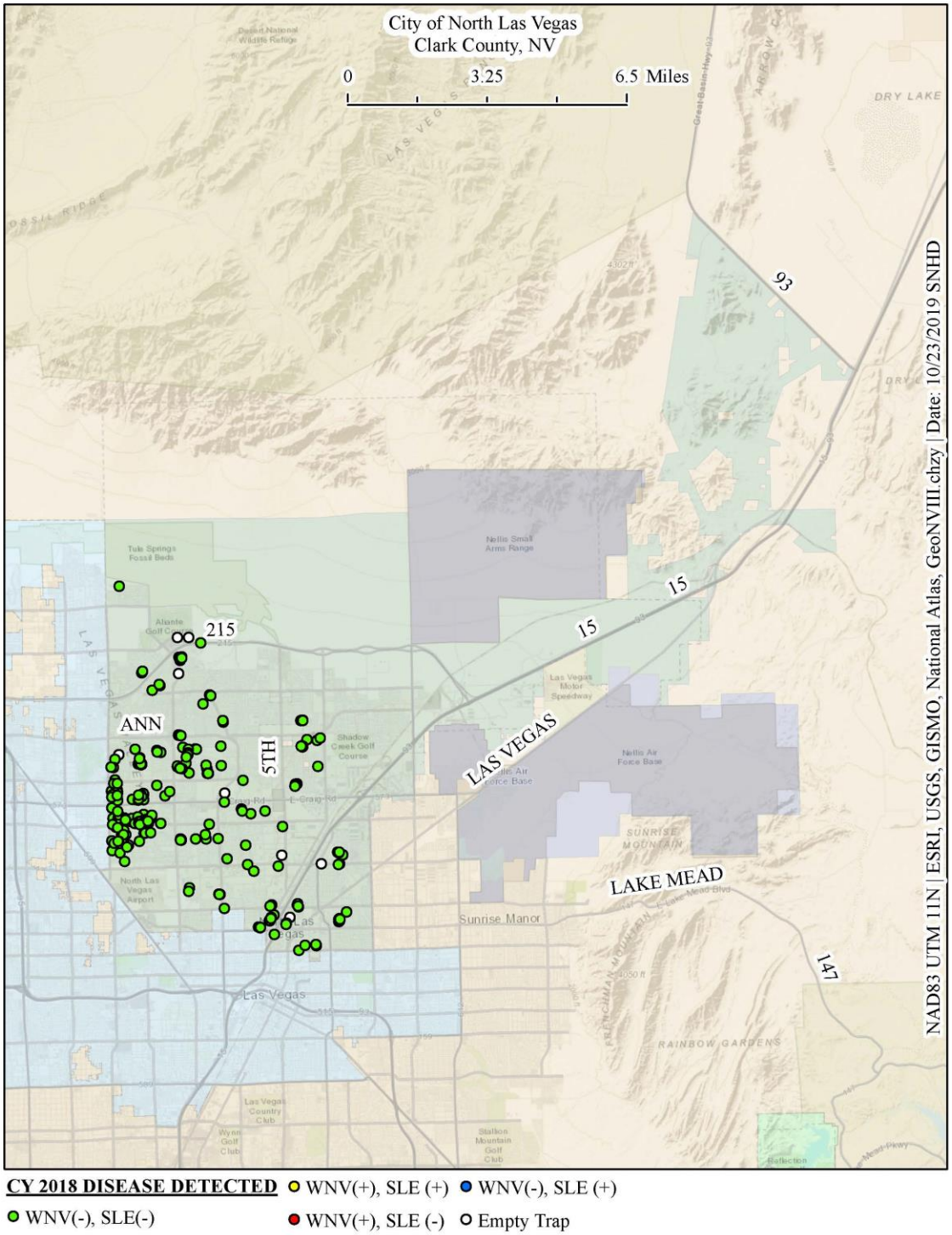
Map 2: Unincorporated Clark County - Mosquito Surveillance Distribution and Results

Traps	Mosquitoes Tested	Mosquito Pools Tested	WNV + Mosquito Pools	# of Mosquitoes in WNV + Pools
466	10,004	1	1	50



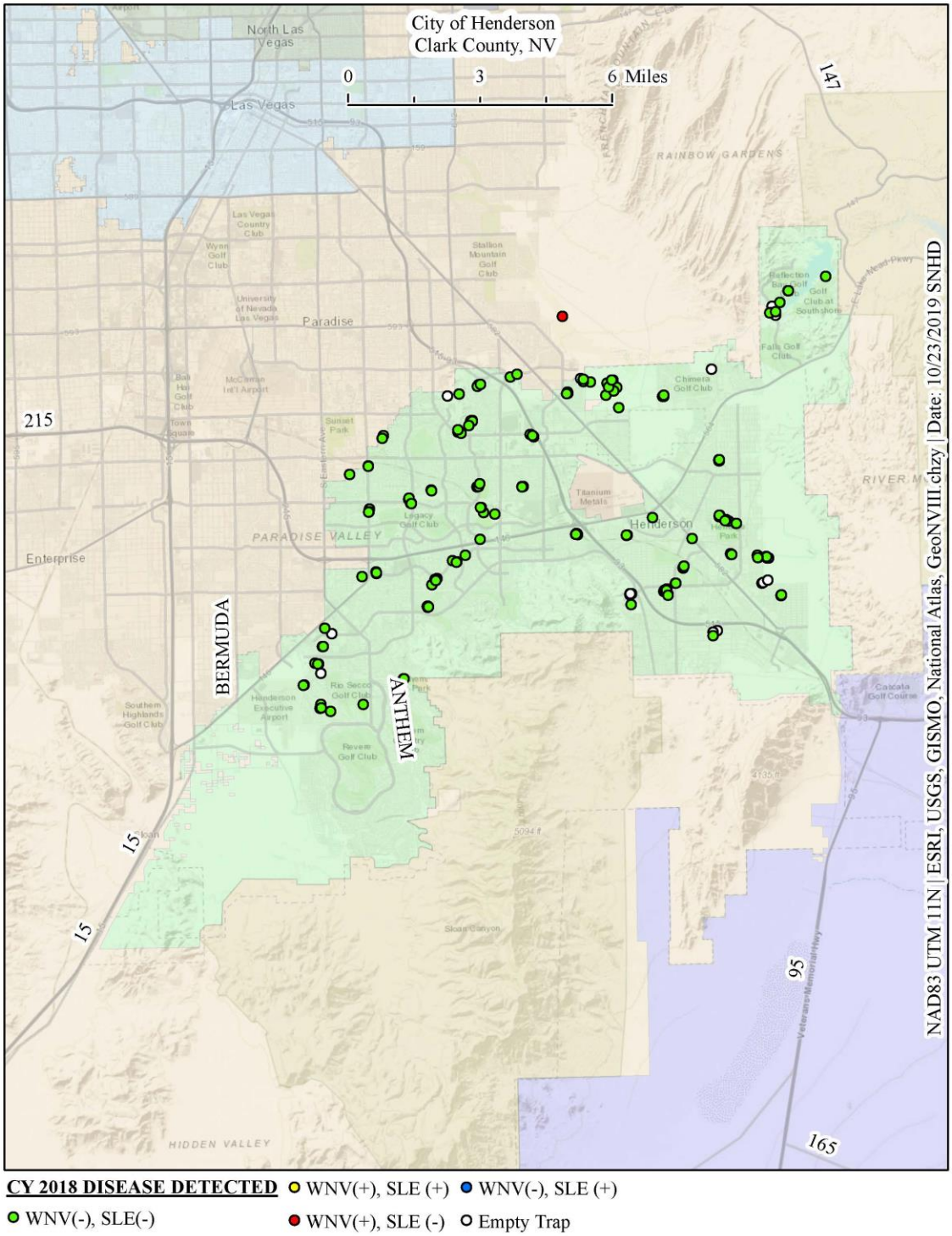
Map 3: City of North Las Vegas - Mosquito Surveillance Distribution and Results

Traps	Mosquitoes Tested	Mosquito Pools Tested	WNV + Mosquito Pools	# of Mosquitoes in WNV + Pools
460	6,211	369	0	0



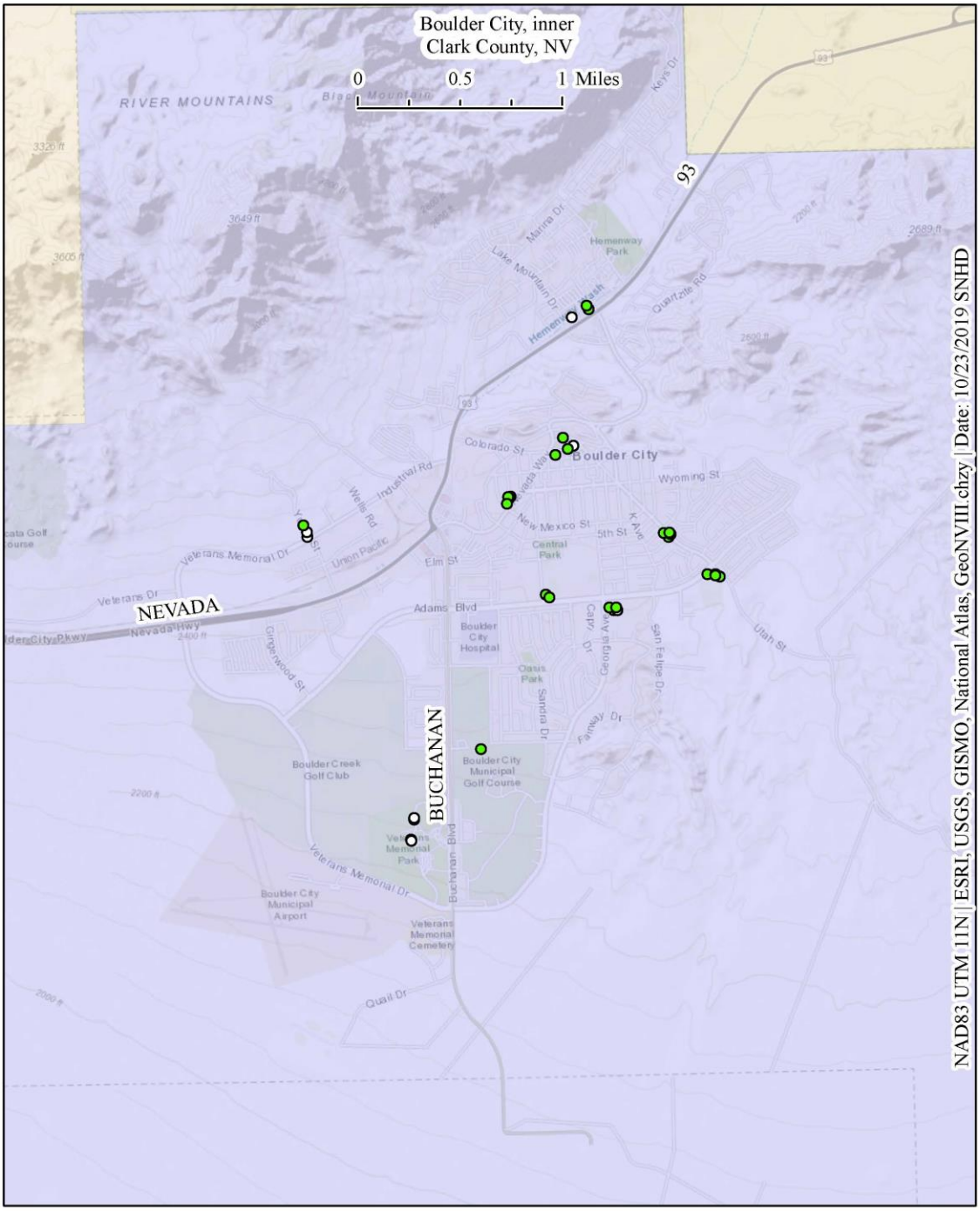
Map 4: City of Henderson - Mosquito Surveillance Distribution and Results

Traps	Mosquitoes Tested	Mosquito Pools Tested	WNV + Mosquito Pools	# of Mosquitoes in WNV + Pools
344	4,531	250	0	0



Map 5: Boulder City - Mosquito Surveillance Distribution and Results

Traps	Mosquitoes Tested	Mosquito Pools Tested	WNV + Mosquito Pools	# of Mosquitoes in WNV + Pools
45	247	24	0	0



Map 6: City of Mesquite - Mosquito Surveillance Distribution and Results

Traps	Mosquitoes Tested	Mosquito Pools Tested	WNV + Mosquito Pools	# of Mosquitoes in WNV + Pools
32	269	35	0	0