

# VectorSurv Helper: Automating the Transfer of Data from PCR Instruments to an Online Database



Joel Studebaker, Aaron Preidel, James Occi, Dana Woell, Mary Carayannopoulos, Thomas Kirn, Fredrick Nindo

New Jersey Department of Health, Public Health and Environmental Laboratories, Ewing, NJ 08628

## Introduction

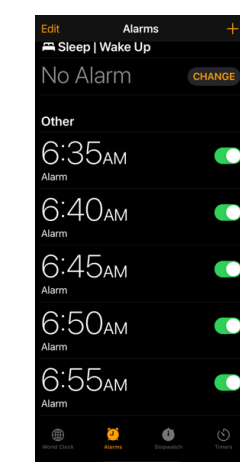
Ticks and mosquitoes collected throughout New Jersey are submitted to the New Jersey Department of Health Public Health & Environmental Laboratories to be tested for diseases carried by those vectors. Instrumented methods based on the polymerase chain reaction (PCR) determine the presence or absence of pathogens in samples, using 96 well plates. Laboratory personnel enter results from each plate into the online VectorSurv (VS) database. We have developed an automated process, VectorSurv Helper, that takes files exported from the PCR instruments and creates files that facilitate review of the results and bulk import into the VS database.

## Methodology

### Three components

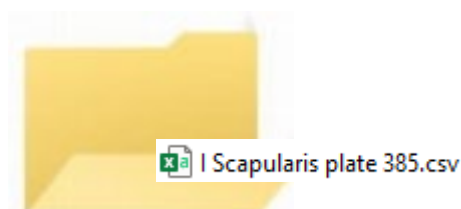
#### Windows Scheduler Task

Initiates a batch file every five minutes, 24/7



#### Batch file

Checks for new CSV files in a designated folder. If it finds one or more, it runs the Python program on each new CSV file and then moves the file to an archive folder



#### Python program

Takes the data from the CSV file exported from the instrument and puts it in the 96 well plate format for the review file and prepares the VectorSurv import file



Currently completed for the ABI 7500 and Quant Studio 5 instruments

Can handle multiplexed tests in the same well and plates with empty wells

## Results

### CSV File from a PCR instrument

Well	Sample Name	Detector	Task	Ct
A1	PHEL 328	Multi- B. burg	Unknown	29.1004
A1	PHEL 328	Multi- B. miya	Unknown	Undetermined
A1	PHEL 328	Multi- B. micr	Unknown	Undetermined
A1	PHEL 328	Multi- A. phag	Unknown	Undetermined

Pivot table transformation

### File for Review

Well	Origin	1	2	3	4	5	6	7	8	9	10	11	12
A	Multi- A. phag	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
A	Multi- B. burg	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
A	Multi- B. miya	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
A	Multi- B. micr	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
B	Multi- A. phag	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
B	Multi- B. burg	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
B	Multi- B. miya	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
B	Multi- B. micr	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
C	Multi- A. phag	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
C	Multi- B. burg	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
C	Multi- B. miya	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
C	Multi- B. micr	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
D	Multi- A. phag	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
D	Multi- B. burg	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
D	Multi- B. miya	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
D	Multi- B. micr	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
E	Multi- A. phag	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
E	Multi- B. burg	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
E	Multi- B. miya	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
E	Multi- B. micr	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
F	Multi- A. phag	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
F	Multi- B. burg	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
F	Multi- B. miya	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
F	Multi- B. micr	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
G	Multi- A. phag	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
G	Multi- B. burg	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
G	Multi- B. miya	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
G	Multi- B. micr	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
H	Multi- A. phag	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
H	Multi- B. burg	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
H	Multi- B. miya	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
H	Multi- B. micr	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under

### Excel Macro

Well	Origin	1	2	3	4	5	6	7	8	9	10	11	12
A	Multi- A. phag	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
A	Multi- B. burg	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
A	Multi- B. miya	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
A	Multi- B. micr	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
B	Multi- A. phag	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
B	Multi- B. burg	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
B	Multi- B. miya	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
B	Multi- B. micr	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
C	Multi- A. phag	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
C	Multi- B. burg	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
C	Multi- B. miya	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
C	Multi- B. micr	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
D	Multi- A. phag	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
D	Multi- B. burg	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
D	Multi- B. miya	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
D	Multi- B. micr	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
E	Multi- A. phag	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
E	Multi- B. burg	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
E	Multi- B. miya	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
E	Multi- B. micr	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
F	Multi- A. phag	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
F	Multi- B. burg	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
F	Multi- B. miya	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
F	Multi- B. micr	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
G	Multi- A. phag	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
G	Multi- B. burg	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
G	Multi- B. miya	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
G	Multi- B. micr	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
H	Multi- A. phag	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
H	Multi- B. burg	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
H	Multi- B. miya	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under
H	Multi- B. micr	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under	Under

Well	Sample Name	Detector	Task	Ct
A1	PHEL 328	Multi- B. burg	Unknown	29.1004
A1	PHEL 328	Multi- B. miya	Unknown	Undetermined
A1	PHEL 328	Multi- B. micr	Unknown	Undetermined
A1	PHEL 328	Multi- A. phag	Unknown	Undetermined

### File for Import

Well	Disease	Value	Result
1 B. burgdorferi s.l.		29.1	Positive
1 B. miyamotoi			Negative
1 B. microti			Negative
1 A. phagocytophilum			Negative
96 B. burgdorferi s.l.		33.29	Positive
96 B. miyamotoi		29.45	Positive
96 B. microti		30.37	Positive
96 A. phagocytophilum		34.53	Positive

<https://vectorsurv.org/>

VectorSurv Home Documentation Gateway Maps YouTube

Let's control vector-borne disease.

## Conclusions

### Impact of Change



Time

At ~15 minutes for manual entry, we save an average of 38 hours a season



Resources

Reduced printouts save three reams (60lbs), or 1,500 sheets of paper per season



Data Retention

Reduced paper leads to a smaller hardcopy footprint. Increased access and legibility of data allows easier visualization and analysis.



Accuracy

Fewer manual steps should increase overall accuracy and is expected to decrease technician error and overall number of NCEs

## References

1. [Getting Started Guide](#) for the Applied Biosystems 7500/7500 Fast Real Time PCR System
2. VectorSurv documentation: <https://vectorsurv.org/docs>
3. VectorSurv Platemap Result Import Specifications.xlsx | Powered by Box (<https://ucdavis.app.box.com/s/8cpq2bhuwsmw83v6gkeee9kpwfbkt2vw>)

## Acknowledgements

Thanks to the development group for VectorSurv at UC Davis for providing a facility that supports bulk import of results.

Thanks to the VectorSurv support group for several useful discussions of the site's features.