

North Carolina Department of Justice

ANNUAL REPORT

FISCAL YEAR 2019-2020

North Carolina State Crime Laboratory



Director Vanessa Martinucci



JOSH STEIN
ATTORNEY GENERAL

STATE OF NORTH CAROLINA
DEPARTMENT OF JUSTICE

SETH DEARMIN
CHIEF OF STAFF

December 9, 2020

Senator Warren Daniel
Senator Danny Britt
Representative James L. Boles, Jr.
Representative Ted Davis, Jr.
Co-Chairs, Joint Legislative Oversight Committee on Justice and Public Safety
North Carolina General Assembly
Raleigh, NC 27601-2808

RE: Report on work of the NC State Crime Laboratory during FY 2019-2020

Dear Chairs of the Joint Legislative Oversight Committee on Justice and Public Safety:

Pursuant to Session Law 2013-360, Section 17.2, the Department of Justice is pleased to submit the Fiscal Year 2019-2020 Annual Report for the NC State Crime Laboratory to the Joint Legislative Oversight Committee on Justice and Public Safety. In addition to the data on evidence submissions, case completions, and other workload measures, the report provides updates on significant achievements and internal improvements that focus on quality, efficiency, and transparency.

Thank you for the opportunity to provide this information. We would be happy to respond to any questions you may have regarding this report.

Sincerely,

Seth Dearmin
Chief of Staff

SD/vjm

cc: William Childs, NCGA Fiscal Research Division

I. Preface	5
II. Quality (Accreditation and Certification).....	5
III. Case Submissions and Completions	5
1. Case Submissions	5
a. Case Submissions by Forensic Discipline and Laboratory Location	6
b. Case Submissions by County.....	8
2. Case Completions	8
a. Lead Times	10
b. Rush Case Program	10
c. Court Testimony and Judicial Efficiencies	10
d. Outsourcing and Untested Sexual Assault Evidence Collection Kits (SAECK).....	11
IV. Process Improvements	13
V. Human Capital	13
VI. Fiscal Resources.....	14
VII. Expansion.....	16
VIII. Conclusion.....	18
Appendix A - Submissions by County.....	20
Appendix B – Case Records Created vs Completed	26

Figure 1 Annual Case Submissions	6
Figure 2 Annual Case Record Completions	8
Figure 3 Court Testimony Hours 2012-2019.....	11
Figure 4 Project FORESIGHT Annual Report, 2017-2018 National Percentile for Cost per Item by Investigative Area	14
Figure 5 FY 2018-2019 Scientific Supply Costs.....	15
Figure 6 FY2018-2019 Scientific Supply Funds from General Appropriations vs Grants	16

Executive Summary

The State Crime Laboratory (SCL) continues to provide forensic services that meet the highest quality standards possible. The SCL has successfully maintained ISO/IEC 17025 (2017) accreditation and compliance with DNA Quality Assurance Standards (QAS). In 2020, the SCL celebrated 32 years of consecutive accreditation.

The SCL has worked diligently since 2013 to apply continuous process improvement principles using Lean Six Sigma methodology. The Laboratory has implemented advanced computerized systems, increased robotic instruments, streamlined evidence management processes, strategically redistributed casework and staff, and improved coordination with the courts and other partners in the criminal justice system.

During the past year, case submissions have increased by 13.5% compared to FY 2018-2019 and increased by 62% in the last five years. This is a strong indicator of the confidence that law enforcement agencies have with the quality of work produced by the SCL. However, under our current scientist staffing level, the SCL is unable to meet this demand year over year. **Since 2017, the lead time has increased from an average of 115 days to an average of 222 days and the pending case records in the laboratory have increased from approximately 9,000 to approximately 20,000.** Drugs and Toxicology make up 80% of all Laboratory submissions and those submissions include complex opioids such as fentanyl and fentanyl-based analogs. These types of drugs require extensive testing, lengthening the turnaround time and resulting in a decrease in the number of cases completed. **In FY 2019-2020, 1,853 Sexual Assault Evidence Collection Kits (SAECKs or SAECK) were submitted as compared to 821 SAECKs in FY 2018-2019 – a 125% increase in just one year.** Increased SAECK submissions have led to increased analysis requests in Trace Evidence and Latent Evidence sections as well. **The last time the SCL received additional Forensic Scientist positions was in 2015, and case submissions have increased significantly since then.**

Due to the passage of the Survivor Act in September 2019 and the increasing demands of the opioid crisis, the Laboratory is in critical need of additional resources to continue to meet law enforcement's testing demands and to keep turnaround times from ballooning. It is important to note that the laboratory requested twelve additional scientist positions for the 2019-2021 state budget; however, the SCL received none of the critical new positions needed as there was no new budget put in place.

Additional scientist positions are critical to keep up with the number of cases submitted and to provide results in a timely manner. As such, we will be respectfully requesting additional positions in the upcoming legislative budget session.

There are three additional challenges the SCL continues to face that we would like to highlight.

The first is the need for additional funding to address the backlog of untested SAECKs in local law enforcement custody. North Carolina's 2019 certified inventory of SAECKs totals 16,179 previously untested kits. A total of 6,911 kits have been tested or are in the process of being tested. However, due to demand nationwide of states outsourcing SAECKs to private labs, the price to outsource SAECKs has increased dramatically, from roughly \$700 per kit to \$1,245 per kit – an increase in excess of 75%. We appreciate the funding the General Assembly appropriated to help test these kits. Because of the legislature's commitment, cold cases are being solved and justice delivered to survivors. Just this week in Asheville, the police solved a rape that occurred 28 years ago because of the General Assembly's commitment to eliminating the backlog. To complete testing and end the backlog of untested kits in our state, the SCL will need \$9M in one-time funding based on the current cost of outsourcing the kits.

The second is the need for a recurring funding source for the purchase of scientific equipment and supplies. A \$1.5 M recurring appropriation would allow for a ten-year replacement schedule for equipment, which would be consistent with

industry standards. A special revenue reserve fund would provide contingency funding to offset periodic reductions in crime laboratory court fees authorized pursuant to NCGS 7A-304(a)(7).

The third is permitting Laboratory scientists to provide court testimony remotely instead of in-person. The current system has become a test of availability of a limited number of scientists, instead of living up to its design of judging cases on their merits. Additionally, allowing remote court testimony for scientists would save hundreds of hours of time, the cost of travel, and help the lab more efficiently test and return evidence, to the benefit of all stakeholders. Remote testimony is authorized pursuant to N.C. Gen. Stat. § 15A-1225.3, however this tool is underutilized as it requires consent by the defendant. The remedy to this frustrating log jam may lie in an amendment to district court rules.

With continued support, the SCL will continue to provide quality and timely forensic analysis and impartial expert testimony for the benefit of our criminal justice system.

NORTH CAROLINA STATE CRIME LABORATORY REPORT

FISCAL YEAR 2019-2020¹

This report is presented to the Chairs of the North Carolina General Assembly Joint Legislative Oversight Committee on Justice and Public Safety and to the North Carolina General Assembly Fiscal Research Division as directed by Section 17.2 of S.L. 2013-360, the Appropriations Act of 2013.

I. Preface

Attorney General Josh Stein appointed Vanessa Martinucci as Director of the State Crime Laboratory (SCL) effective August 26, 2019, after John Byrd's retirement on July 1, 2019.

II. Quality (Accreditation and Certification)

The SCL's forensic services continue to meet the highest quality standards possible. The SCL maintains accreditation under strict ISO/IEC 17025 requirements and is accredited by the ANSI National Accreditation Board (ANAB). ANAB is a signatory to the International Laboratory Accreditation Cooperation (ILAC) as required by Session Law 2011-19 on accreditation for the SCL. During 2020, the Laboratory received its surveillance assessment by ANAB. During the assessment, the scope of the Western Regional Laboratory accreditation was expanded to include IBIS. The SCL also had its annual DNA Quality Assurance Standards (QAS) audit. There were no outstanding issues identified by ANAB or the QAS assessment team.

III. Case Submissions and Completions²

1. Case Submissions

In FY 2019-2020, **42,064** examination submissions, including over **57,479** items of evidence, were accepted at the SCL's three locations. (See Appendix A) This is a **10.7% increase in case examination submissions** compared to FY 2018-2019. Submissions have been increasing each year since FY 2014-2015 with a **62% increase over the last five years**. Including DNA Database submissions, the SCL received 61,810 submissions in FY 2019-2020.

Case submissions are broken down as follows:

- The **main SCL in Raleigh** received 19,989 case records and 19,746 DNA Database submissions for a total of 39,735 submissions.
- The **Triad Regional Crime Laboratory** received 10,379 case records.
- The **Western Regional Crime Laboratory** received 10,722 case records.

¹This Report addresses the statutorily mandated "previous fiscal year" (July 1, 2019 - June 30, 2020), and thus only briefly mentions, when required by context, important Crime Lab developments occurring on or after July 1, 2020.

² This information is provided in compliance with S.L. 2013-360 (1) and (2) which requires that the Annual Crime Laboratory Report contain "(1) Information about the workload of the Laboratory during the previous fiscal year, including the number of submissions, identified by the forensic discipline, received at each location of the Laboratory. (2) Information about the number of cases completed in the previous fiscal year, identified by forensic discipline, at each location of the Laboratory."

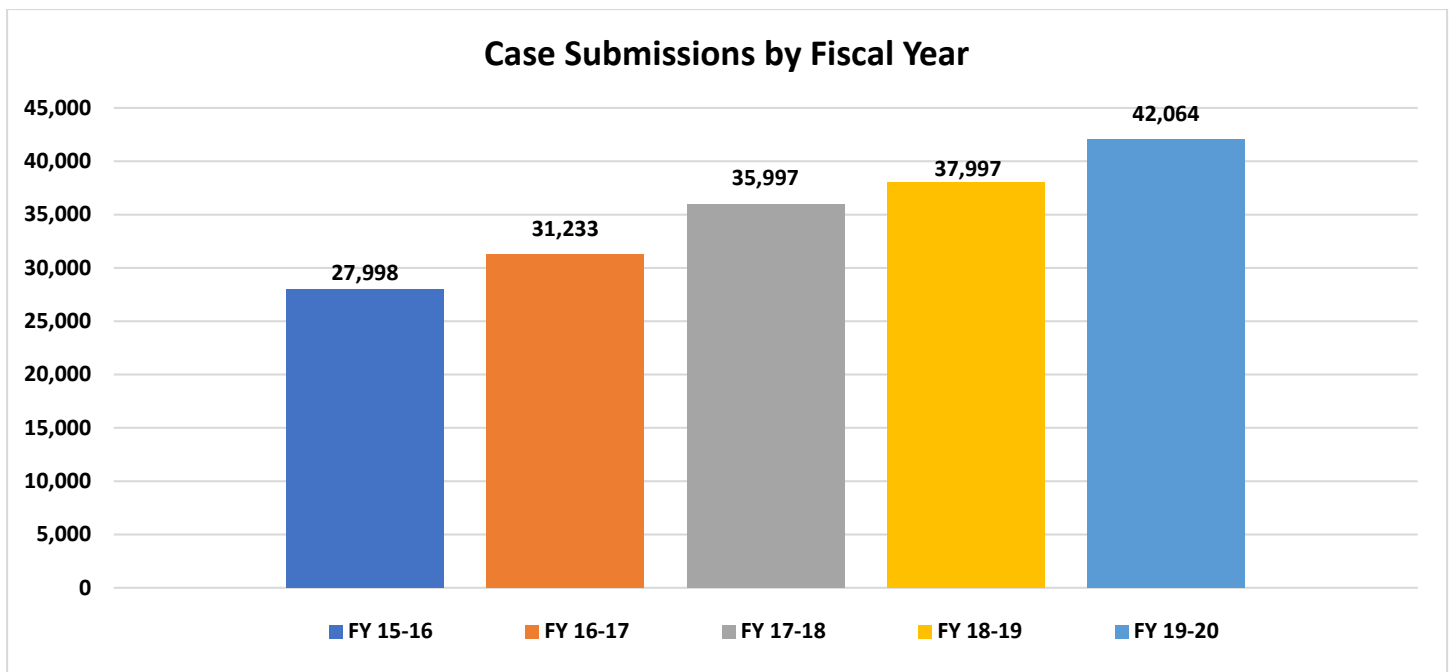


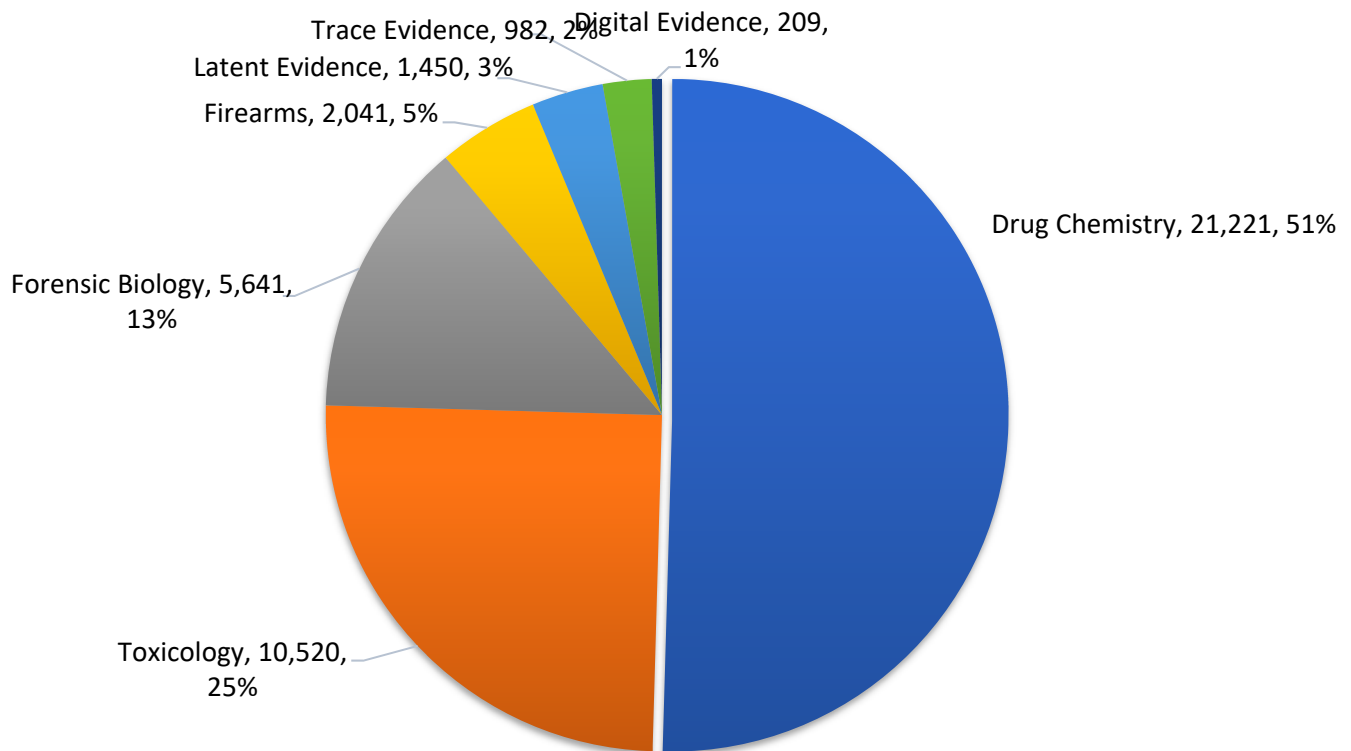
Figure 1 Annual Case Submissions

a. Case Submissions by Forensic Discipline and Laboratory Location

In FY 2019-2020, the SCL received the following cases, broken down by forensic discipline and laboratory location:

	<u>Raleigh</u>	<u>Triad</u>	<u>Western</u>	<u>TOTALS</u>
Drug Chemistry	9,674	4,718	6,829	21,221
Toxicology	4,799	3,414	2,307	10,520
Forensic Biology	3,681	1,028	932	5,641
Firearms	1,217	475	349	2,041
Latent Evidence	811	491	148	1,450
Trace Evidence	614	227	141	982
Digital Evidence	167	26	16	209
TOTALS	19,989	10,379	10,722	42,064

Submissions by Discipline for FY 2019-2020



In FY 2019-2020 approximately 3,592 of the 19,746 DNA database samples received were duplicates. The number of duplicates (an additional sample from the same individual) has decreased by almost 50% since FY 2017-2018. However, duplicate submission and improper use of kits during collection continues to impact the DNA Database Section. The Laboratory pays approximately \$6.00 per kit (includes postage cost) for the collection kits, which are provided to law enforcement agencies at no cost. **The duplicates submitted in FY 2019-2020 cost approximately \$20,000.** Efforts are underway to better educate the members of law enforcement on duplicate submissions, including sending letters to agencies with a high duplicate submission rate, and providing training to the Department of Public Safety (DPS) prison staff. The DNA Database Section also partnered with Department of Justice (DOJ) IT and the Government Data Analysis Center (GDAC) to integrate the DNA Database SpecMan specimen manager system with Criminal Justice Law Enforcement Automated Data Systems (CJLEADS). This partnership resulted in another method collecting officers can use to verify the need for a new DNA sample. It also enables the Laboratory to identify instances where a sample was not collected. To maximize taxpayer resources, the Laboratory encourages ongoing training in efficient collection procedures for submitting law enforcement agencies. Training to reduce duplicate sample submissions is available on the North Carolina Justice Academy website.

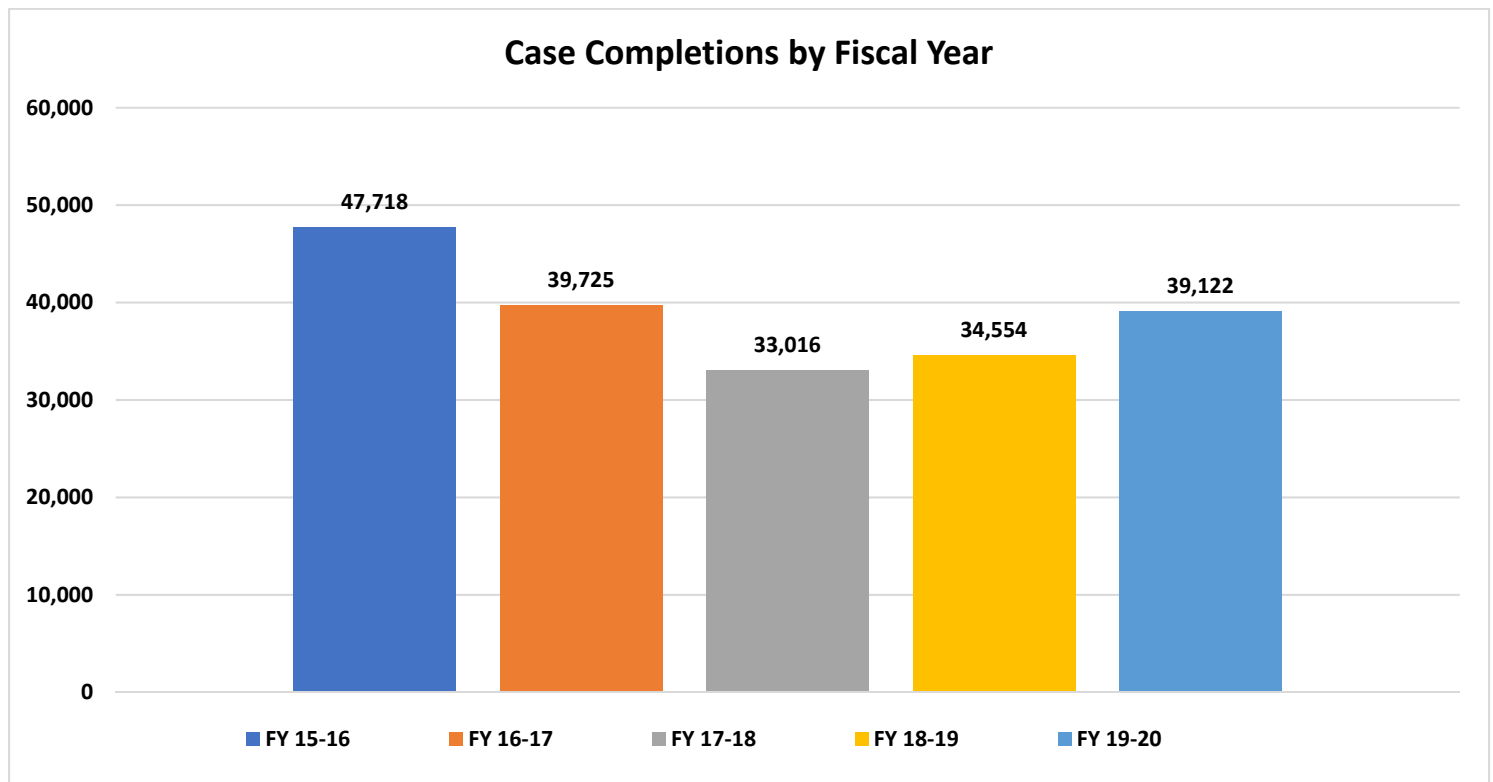
b. Case Submissions by County³

Case work and evidence item submissions over the past five fiscal years per North Carolina County may be found in Appendix A.

2. Case Completions

For FY 2019-2020, scientists in the SCL system worked 39,122 case records, broken down as follows:

- The **main SCL in Raleigh** worked 18,950 case records.
- The **Triad Regional Crime Laboratory** worked 7,458 case records.
- The **Western Regional Crime Laboratory** worked 12,714 case records.



Note: The completed cases reported above include completed examinations and partially worked cases terminated by the customer.

Figure 2 Annual Case Record Completions

³This information is provided in compliance with S.L. 2013-360 (3) which requires that the Annual Crime Lab Report contain "A breakdown by county of the number of submissions received by the Laboratory in the previous fiscal year." The numbers in these tables do not include Convicted Offender or DNA upon Arrest submissions.

Case Record Completions by Forensic Discipline and Laboratory Location

In FY 2019-2020, the SCL completed the following cases, broken down by discipline and laboratory location:

	<u>Raleigh</u>	<u>Triad</u>	<u>Western</u>	<u>TOTALS</u>
Drug Chemistry	8,218	4,395	8,835	21,448
Toxicology	3,855	2,803	1,701	8,359
Forensic Biology	3,275	2	1,106	4,383
Firearms	1,515	2	531	2,048
Latent Evidence	1,084	254	517	1,855
Trace Evidence	860	2	24	886
Digital Evidence	143	0	0	143
TOTALS	18,950	7,458	12,714	39,122

Total case completions have increased this fiscal year, although they are still lower than in FY 2015-2016. Due to the COVID-19 pandemic, Chief Justice Cheri Beasley issued an order on March 13, 2020 that delayed all superior and district court proceedings through the end of FY 2019-2020. This closure allowed scientists to dedicate their time to casework, therefore increasing the number of completed cases.

It is important to note that one submission often equals more than one case record. In FY 2019-2020, in all but one or two months, the number of case records created is higher than the number of case records completed. (See Appendix B for detailed charts with the numbers for Drug Chemistry, Toxicology, and Forensic Biology.) This has led to an increase in the pending case records in the laboratory, which has gone from **approximately 9,000 to approximately 20,000 since 2017.**

DNA Database CODIS samples processed: Notable successes of the DNA Database Section include a **record 905 hits to the DNA database in FY 2019-2020**, which now contains more than **375,000 DNA profiles**. Of the 905 hits, 458 or approximately **51% of them are from sexual offenses**. The increases noted in SAK submissions and the CODIS hits is directly related to the increased focus that has been placed on the testing of sexual assault kits. New technology now allows faster input of DNA samples into the database where it can be used to identify suspects in unsolved cases.⁴

There are two offenses currently not in the Arrestee DNA Database law that if added could be impactful and not significantly increase the volume or cost of DNA database sample submissions. These are Misdemeanor assault on a female and child (14-33 (c)2 and 14-33 (c)3, respectively) and Violation of a valid protection order (50B-4.1(a)).

⁴ At the writing of this report, the average time to receive convicted offender (CO) or arrestee (AR) samples and input into the database is approximately 17 days.

a. **Lead Times⁵**

Lead times at the SCL continue to improve as additional scientists complete their required training and begin to work on active cases. **Average lead time for the SCL (the time the customer feels) is 222 days.** Lead times for individual cases vary depending on the amount of evidence submitted and the type or types of analysis requested.

b. **Rush Case Program**

The SCL continues to operate a successful rush case program to give Law Enforcement Agency Heads or District Attorneys the option to expedite cases when appropriate. Upon the request of a Law Enforcement Agency Head or District Attorney, **the SCL can rush or expedite a case for public safety or court purposes.** Depending on the evidence submitted and the type(s) of analysis requested, rush cases can be worked in a matter of days. Laboratory management welcomes inquiries from Law Enforcement Agency Heads or District Attorneys about cases when a rush request may be needed.

c. **Court Testimony and Judicial Efficiencies**

In FY 2019-2020, Laboratory scientists spent a total of **2,789** hours traveling to court, waiting to testify or testifying. Of those hours, SCL scientists spent 1,534 hours traveling to court, **935 hours waiting to testify**, and 320 hours testifying (See Figure 3). Due to the COVID-19 pandemic, Justice Beasley issued an order on March 13, 2020 which delayed all superior and district court proceedings through the end of FY 2019-2020. However, **assistance is still needed from our criminal justice stakeholders** to minimize the time forensic scientists spend in court and away from the laboratory. **Only 11% of the time an analyst spent outside the laboratory for court purposes was spent testifying.** More time spent by scientists in court or traveling to court means less time in the laboratory working on cases. The seventeen recommendations from the *UNC School of Government's Report of the Crime Laboratory Working Group: Administrative Solutions to Alleviate Lab Backlog* specifically outlines recommendations to minimize wait time for our analysts.

⁵ **Lead Time** is defined as the time from when the evidence is submitted to the SCL to when the report is published. This includes time the evidence sits in the Laboratory evidence vault waiting to be assigned to an analyst. **Turnaround time** is defined as the time from when the analyst receives the evidence until the time they publish a report at the completion of their analysis.

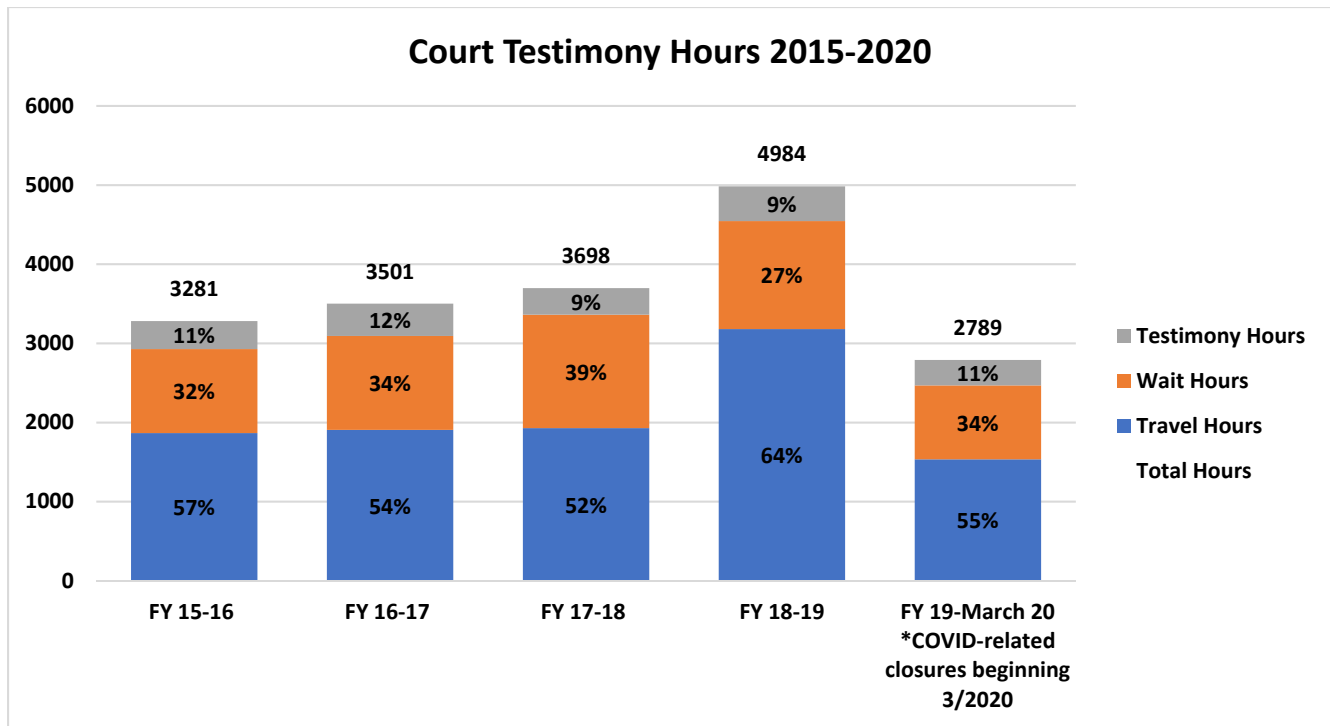


Figure 3 Court Testimony Hours 2015-2020

Nearly half of all Judicial Districts in North Carolina agreed to adopt the recommendations from the School of Government report. **The SCL acknowledges the positive attention given to this important matter and continues to request assistance from our criminal justice stakeholders to minimize time forensic scientists spend in court and away from the laboratory.**

Remote testimony is authorized pursuant to N.C. Gen. Stat. § 15A-1225.3, however this tool is underutilized as it requires consent by the defendant. The remedy to this frustrating log jam may lie in an amendment to district court rules. The amendment could allow remote testimony when the State declares the unavailability of a witness due to a list of reasons thus overcoming defense objection. Both federal and state case law supports the use of remote testimony over objections that would be raised pursuant to the 6th Amendment’s Confrontation Clause. A carefully tailored amendment could protect defendant’s rights all the while it saves scarce resources and protects public health. Once parties become comfortable with the changes in district court, and it has passed judicial scrutiny, it could be expanded into superior court.

d. Outsourcing and Untested Sexual Assault Evidence Collection Kits (SAECK)

In June of 2017, the legislature in consultation with DOJ, enacted Section 17.7 of Session Law 2017-57 to require every law enforcement agency to conduct an inventory of untested Sexual Assault Evidence Collection Kits (SAECKs) located throughout the state and report their findings to DOJ no later than January 1, 2018. On March 1, 2018, DOJ reported that there were 15,160 untested SAECKs in NC. A more recent follow up certified inventory found the total number of untested SAECKs in local law enforcement custody was 16,179.

In 2018, the DOJ requested the General Assembly provide funding to get a jump start on testing, authorize the creation of a tracking system for SAECKs, and authorize a multidisciplinary working group made up of representatives from law enforcement, district attorneys, community advocates, and lab scientists to develop a strategic plan to address the

statewide backlog. While the legislature did not provide any funding in 2018, it did approve the creation of a tracking system and the multidisciplinary working group.

During the interim, before the 2019 session of the General Assembly, DOJ spearheaded an initiative to get a jump-start on testing previously untested SAECKs located throughout the state. To obtain the necessary resources for testing, DOJ/SCL secured \$2M in funding from the Bureau of Justice Assistance Sexual Assault Kit Initiative (SAKI) and \$2M from the Victims of Crime Act funding (VOCA) to help cover the costs associated with the identification and testing of SAECKs. After securing these funds, the SCL began working with local law enforcement to outsource their inventoried untested SAECKs.

In December of 2018, the multidisciplinary working group completed their work and provided the Attorney General a report recommending a best practice process to test all testable SAECKs. This report served as the basis for the Standing Up For Rape Victims Act Of 2019, or Survivor Act, (House Bill 29 and Senate Bill 46) which the General Assembly enacted and became law in September of 2019.

The Survivor Act appropriated \$6M of general funds to aid in the testing of remaining SAECKs and a statutory process for testing all SAECKs. This new law ensures that a backlog will not develop in North Carolina again, but it has resulted in a drastic increase in submissions of SAECKs from law enforcement to the SCL. The number of SAECK submissions from law enforcement to the SCL grew from 821 in 2018-19 to 1,853 in 2019-2020. This represents a 125% increase in just a single year. Unfortunately, because a full budget was not passed, the General Assembly did not fund the additional scientists the SCL requested to handle the increased volume of kits. While DOJ and the SCL enthusiastically welcome testing these kits as an important enhancement to public safety, the need for additional staff is pressing.

The increased submissions of SAECKs falls squarely on the shoulders of our Forensic Biology Section. They are tasked with receiving the requests from agencies for SAECK testing, reviewing the outsourcing request form to ensure that the case will be CODIS eligible and meets the requirements of the Survivor Act for testing, and approves the case for shipping to a vendor laboratory. The vendor laboratory processes the case and reports the results directly to the law enforcement agency as well as the SCL. The SCL also reviews qualifying data from the vendor laboratories for upload into CODIS.

Unfortunately, several months after receiving the additional general fund money, the federal government declared that the VOCA funds that DOJ received prior to the Survivor Act passing could not be used for testing. Additionally, the federal government determined that the SAKI funds could not be used for kit testing until the general fund appropriated money had been depleted. Therefore, once the Survivor Act funds were made available, the SCL could no longer use the VOCA or SAKI funds to test SAECKs.

Additionally, the SCL had an outsourcing contract with a vendor laboratory that expired on June 30, 2020. A new contract was awarded to two vendor laboratories, which became effective on July 1, 2020. Due to the nationwide demand for SAECK testing as well as the inclusion of courtroom testimony fees, the cost per kit increased from \$695 per kit to \$1,245 per kit, a 79% increase.

With the increased cost per kit, the return of the VOCA grant funds, and the inability to use SAKI funding for outsourcing, an additional \$9M will be needed to test the backlog of previously untested SAECKs located throughout the state. We will be respectfully requesting this funding as well as additional forensic scientists in the upcoming legislative budget session to meet the requirements of the law and the needs of law enforcement.

The testing of these old kits is solving crimes. As of the writing of this report, 6,911 kits are in the process of being tested or have been tested. Testing has been completed on approximately 2,100 kits, while the others are currently with the vendor lab for testing or are in review and approval for shipping. These completed tests have led to numerous arrests in longstanding cold cases – as forty percent of those tested kits with an eligible CODIS profile have a CODIS

hit to a known offender or another case, allowing law enforcement to move forward. For example, in Winston Salem a suspect was charged with first-degree rape and first-degree kidnapping due to testing a SAECK collected in 1993. In Fayetteville, a suspect was charged after DNA testing linked him to nine sexual assaults that occurred in 2009 and 2010. In Asheville, a CODIS hit match on a SAECK from 2008 led to second-degree forcible rape charges. Most recently, Durham's Police Department announced eleven arrests in connection with 15 cold sexual assault cases.

Based on projections of testing capacity by the vendor laboratories, the Survivor Act funding of \$6M should be encumbered by early 2022. With the additional \$9M in funding and assuming the private labs perform to their contract, we project that all previously untested SAECKs that require testing based upon the Survivor Act could be tested by 2023.

All information regarding the STIMS project has been reported in the legislatively mandated STIMS report required by NCGS § 114-65.

IV. Process Improvements

The SCL continues its concerted effort to identify cases that have been disposed of in court ("stop-work cases") and no longer need forensic analysis. The **SCL routinely provides prosecutors with lists of cases** that appear to have cleared the court system but for which the Laboratory has not received a disposition notice, requesting confirmation that the case is completed and that no further Laboratory work is required. The NC Conference of District Attorneys has facilitated prosecutorial review of these notices and **all forty-three District Attorneys are participating**. As a result, the SCL is able to focus on the cases where forensic analysis is still needed.

The SCL continues to partner with the NCDNJ's Information Technology Division, NC Government Data Analytics Center (GDAC), NC Conference of District Attorneys, NC Administrative Office of the Courts (AOC), and the Statistical Analysis System (SAS) Institute, Inc. to develop a software solution to **automate the stop-work process within the laboratory information management system. District Attorneys will be able to access and update case dispositions through the State Crime Laboratory's web-based laboratory information management system without the Laboratory providing lists.**

The SCL worked with GDAC to enhance the automated process to identify cases that meet statutory requirements for disposal. The automated report has helped eliminate the number of adjudicated DWI blood tubes in Laboratory custody and ease the burden for investigating agencies to refrigerate cases after analysis. The State Crime Laboratory has successfully been able to dispose of **14,251** cases in storage since the automated system was implemented in February 2019. The passage of G.S. 20-139.1(h) has positively impacted the Crime Laboratory's storage capacity by allowing the disposal of the blood tubes in adjudicated cases (which meet statutory requirements).

V. Human Capital

In FY 2019-2020, there were 20 hires, 20 resignations, and 1 retirement. The SCL had a vacancy rate of 11.4% at the end of the fiscal year. The process of filling these vacancies and training a new scientist can take from one to two years.

The SCL and DOJ continue to work to find ways to attract and retain highly qualified employees. The past two fiscal years have seen improvement in the ability to fill vacancies. However, more can be done to retain scientists, as salary and lack of opportunity for advancement are consistent reasons cited for scientists leaving employment with the SCL.

Another concern is the ability to recruit and maintain scientists in the Digital Evidence Section. This section is responsible for computer forensic analysis in cases with offenses ranging from child pornography to financial fraud. The Section currently has three vacancies and has been unable to recruit and fill qualified candidates due to the large pay differential with the private sector.

VI. Fiscal Resources⁶

At the beginning of calendar year 2014, the SCL began participating in **Project Foresight** through the West Virginia University, College of Business & Economics. The purpose of the collaboration was to begin building a detailed picture of the fiscal resources required to operate a forensic laboratory to include determining the cost of each test.

The FORESIGHT Project Report indicates that the SCL is comparable to other like-size, publicly funded state forensic laboratories servicing like-size state populations. **Ten of the thirteen investigative areas noted were less in cost per case compared to the FORESIGHT 75th National Percentile.** Note that one item may be investigated and counted in several investigation areas. The cost includes allocations for capital, wages & salary, benefits, overtime & temporary hires, chemicals, reagents, consumables, gases, travel, quality assurance and accreditation, service of instruments, non-instrument repairs and maintenance, equipment leasing, utilities, telecommunications, overhead, and other expenses. (See Figure 4.)

Project FORESIGHT Annual Report, 2018-2019
Cost per Case by Investigative Area

Area of Investigation	25th percentile	Median	75th percentile	State Crime Laboratory
Toxicology ante mortem (excluding BAC)	\$580	\$719	\$917	\$989
Blood Alcohol	\$102	\$150	\$249	\$94
Digital evidence	\$2,474	\$4,270	\$6,446	\$3,873
DNA Casework	\$1,073	\$1,364	\$2,152	\$1,123
DNA Database	\$37	\$56	\$97	\$124
Drugs - Controlled Substances	\$242	\$318	\$393	\$307
Fingerprints	\$595	\$808	\$1,089	\$1,434
Fire analysis	\$1,612	\$2,397	\$3,424	\$673
Firearms and Ballistics	\$1,096	\$1,682	\$2,630	\$848
Gun Shot Residue (GSR)	\$2,156	\$2,863	\$3,696	\$316
Marks and Impressions (Shoe prints/tire tracks)	\$4,736	\$6,158	\$8,413	\$3,147
Serology/Biology	\$779	\$940	\$1,350	\$484
Trace Evidence	\$3,300	\$6,288	\$6,701	\$3,299

Figure 4 Project FORESIGHT Annual Report, 2018-2019 National Percentile for Cost per Case by Investigative Area

As newly-hired scientists completed their training and began work on active criminal cases and as submissions have increased for the last five years, the SCL's **supply costs have also increased**. During FY 2019-2020, the SCL expended more than \$1.67M on scientific supplies of which 70% was DNA-related. Specifically, \$1,177,814 was expended on DNA, while \$491,433 was expended on non-DNA disciplines. (See Figure 5). Of that amount, **23% or \$377,662**

⁶S.L. 2013-360 (4) also provides that the Annual Crime Laboratory Report contain "[a]n average estimate of the dollar and time cost to perform each type of procedure and analysis performed by the Laboratory." The Crime Laboratory initiated participation in "Project Foresight," operating out of West Virginia University, which compiles such information for forensic laboratories. The data collection deadline for the Project Foresight Annual Report published the next May is Dec.1. The FY 2019-2020 State Crime Laboratory Annual Report is the fourth year in which a full year of data reflecting a comparative breakdown of analysis costs is being addressed.

(decreased from 27% or \$471,620 in FY 2018-2019) was from General Fund Appropriations and the remaining **77%** or \$1,291,587 (compared to 73% or \$1,292,704 from FY 2018-2019) was from Grant funding. (See Figure 6).

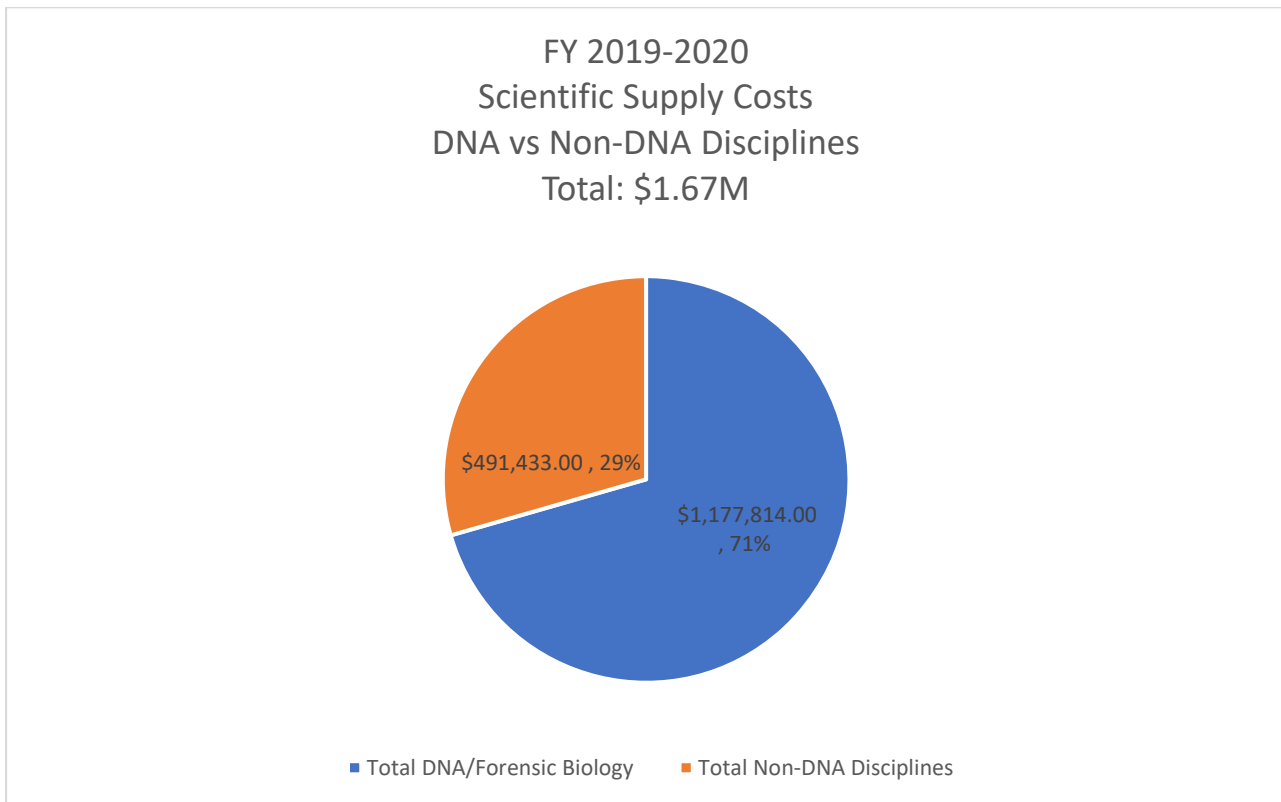


Figure 5 FY 2019-2020 Scientific Supply Costs

FY 2019-2020
Scientific Supply Costs
General Appropriation Fund vs Grant Funds
Total: \$1.67M

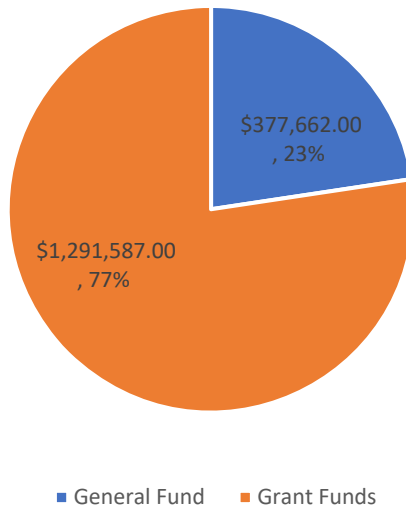


Figure 6 FY2019-2020 Scientific Supply Funds from General Appropriations vs Grants

During FY 2019-2020, the SCL had active funding from various federal grants totaling over \$12M. Funding was utilized to: replace scientific equipment, purchase supplies, outsource sexual assault kits, hire temporary personnel to perform site audits for untested sexual assault kits, hire personnel to develop the STIMS and SpecMan systems and to pay for training to meet mandated certification and accreditation requirements.

The North Carolina Forensic Science Advisory Board, composed of 15 renowned national forensic experts, reported in a letter to the North Carolina General Assembly the “*tremendous progress by the State Crime Laboratory over the past 36 months...*” as well as “*...an urgent need for more Laboratory resources.*” The **Board unanimously supported and strongly recommended** that the General Assembly establish a **special revenue reserve fund to finance non-recurring expenses** such as scientific equipment and to **increase funding for scientific supplies to offset decreasing federal grants**. The SCL currently has approximately \$15.8 M in equipment instrumentation/inventory. To remain a state-of-the-art forensic laboratory, scientific instrumentation and equipment must be replaced and updated based on current industry standards. Realistically, \$1.5 M recurring would allow a ten-year replacement schedule and combined with the nearly \$3.7 M received over the last four years, the SCL would be very close to industry standards. A special revenue reserve fund would provide contingency funding to offset periodic reductions in crime laboratory court fees authorized pursuant to NCGS 7A-304 (a) (7).

VII. Expansion

The SCL continued to expand its services, replace outdated equipment, and conduct significant analysis to determine the future needs within each of the disciplines. Some examples are noted below.

The SCL now has a familial search program. Cases like the “Golden State Killer” brought national attention to the capabilities of this form of database searching. Familial searching uses Y-STR methods (*male lineage, or Y-chromosomal*) and is a joint effort between the Forensic Biology and DNA Database sections. This tool will be performed on a limited scope and has the potential to assist law enforcement agencies with investigatory leads in cold cases. The Forensic Biology section of the Laboratory also implemented probabilistic genotyping software (STRmix) to aid in the complex nature of DNA mixture interpretation. The implementation of STRmix further aligns the SCL with the current technological trends seen in the forensic DNA community.

The SCL expanded the scope of accreditation to include entries and uploads to the National Integrated Ballistic Information Network (NIBIN) at the Western Regional Laboratory. NIBIN is the only national network that allows for the capture and comparison of ballistic evidence to aid in solving and preventing violent crimes involving firearms. The Bureau of Alcohol, Tobacco, Firearms, and Explosives (BAFTE) has put a spotlight on the National Integrated Ballistic Information Network (NIBIN) program. The BATFE is encouraging smaller agencies across North Carolina to utilize the NIBIN program to aid their investigations. This is driving an increase in NIBIN case submissions to the Firearms Section. The Firearms Section has seen an increase in the number of leads generated which leads to more requests for NIBIN confirmations being submitted as well.

The Drug Chemistry Section continued to receive cases of hundreds to thousands of bindles containing suspected heroin and/or fentanyl. Analysis of these items involves counting and verifying the number of units present, documentation and analysis of multiple units in order to meet statutory weight thresholds. Often there are more than one controlled substance present in these samples or varying concentrations of these substances, which requires repeat and or additional analysis and takes longer for scientists to work. For the first and second quarters of 2020 the top five controlled substances and their percentage of total cases completed were as follows: methamphetamine (43%), cocaine (22%), heroin (13%), fentanyl (11%) and plant material containing tetrahydrocannabinol (THC) but NOT cannabidiol (CBD) (4%).

In FY 2019-2020 the Toxicology sections of the SCL tested 2,284 DWI related blood samples for drugs. There was an average of 2.3 different drugs identified in the samples that had drugs in them. The most prevalent drugs identified were: Cannabinoids (THC and metabolites; Marijuana) – 47%; Benzodiazepines (e.g. - Xanax, Valium, Klonopin, etc.) – 36%; Opioids (e.g. - morphine, oxycodone, fentanyl, etc.) – 35%; Methamphetamine – 22%; Cocaine (and its metabolites) – 19%. Grant funds were used to purchase and validate methods for Q-TOF instrumentation at all three laboratories. This instrumentation allows for the screening of over two hundred different drugs. Toxicology now has the ability to detect compounds previously not seen in casework, as well as have better detection limits for other compounds. Toxicology is also nearing the completion of a validation for a LC/MS/MS method for the identification and quantitation of Opioids. This validation is slated to be completed by the end of 2020.

Mobile device submissions have continued to increase for the Digital Evidence section. The current examination tools do not allow for the processing of newer iOS versions nor Android devices that are locked by the user and the passcode is unknown. The section has procured an advanced software tool that will provide support for newer iOS devices and Android devices.

The SCL is requesting additional scientists during the next legislative session to effectively help the criminal justice system use science to promote justice.

As stated earlier, case submissions to the SCL have increased **62% over the past five years**. This is a strong indicator of the confidence that law enforcement agencies have with the Laboratory’s work. However, under our current scientist staffing level, the SCL is unable to meet this demand year over year. Since 2017, the lead time has increased

from an **average of 115 days to an average of 222 days** and the pending case records in the laboratory have increased from **approximately 9,000 to approximately 20,000**. **The last time the SCL received additional Forensic Scientist positions was in 2015, and case submissions have increased significantly since then.**

To close the gap between cases submitted and cases completed we will be requesting twelve additional positions, forensic scientists levels II and III, and forensic scientist supervisors, in the upcoming legislative session. It is important to note we requested funding during the 2018-2019 legislative session to secure twelve additional positions, however only five were provided in the General Assembly's 2019-2021 Budget Conference Report. Without an approved State Budget for 2019-2021, we did not receive those five positions.

These additional positions are critical. Since a majority of **Drug and Toxicology submissions** now include complex opioids such as fentanyl and fentanyl-based analogs, these types of drugs require extensive and complicated testing that lengthen turnaround times. Moreover, due to the recent passage of the **Survivor Act (S.L. 2019-221)** and the push to make better use of the NIBIN program - both **sexual assault kit evidence and firearms evidence** make up the other major categories of submissions that continue to grow. **In FY 2019-2020, 1,853 SAECKs were submitted as compared to 821 SAECKs in FY 2018-2019.** Increased submissions of SAECKs have led to an increase in CODIS hits, which require **CODIS hit confirmations by the Latent Evidence Section**. **The Trace Evidence Section has seen a 35% increase in hair examination requests** due to the increase in SAECK testing.

The Drug Chemistry Section requires additional scientists to help aid in reducing the backlog. After completing an eight-month training program, a new scientist can process approximately 300 cases per year. It is estimated that for every scientist hired, the turnaround time is reduced by 5%.

Additional scientists in the Forensic Biology section will enable the section to form a dedicated CODIS Unit which will **streamline the sexual assault kit testing process** by; 1. Reviewing and approving sexual assault kits for outsourcing, 2. Reviewing data received by the outsourcing vendor, 3. Uploading of profiles to CODIS, and 4. Generating CODIS hit notifications. It typically takes 1.5 years to train a DNA analyst and once trained the typical Forensic Scientist is able to produce approximately 190 cases annually.

For Latent Evidence, adding additional scientists will enable the section to process and compare cases with a more efficient turnaround time. The scientists will also **conduct CODIS Hit verifications** for sexual assault kit evidence, as well as evidence from other types of crimes. Once trained (which takes approximately 9-12 months) a latent analyst will be able to work 100 cases a year.

VIII. Conclusion

The SCL has worked to continuously improve, using Lean Six Sigma efficiency methodology, advanced computerized systems, increased robotic instruments, streamlined evidence management processes, strategic redistribution of casework and staff, and improved coordination with the courts and our partners in the criminal justice system. The SCL has reached a point at which continued progress can only be gained with additional resources.

To remain a state-of-the-art forensic laboratory, scientific instrumentation and equipment must be replaced and updated based on current industry standards. The SCL has been successful in using grant funds to replace instrumentation over the last couple of years. Grant funding is not a reliable source for funding and the SCL needs a permanent solution. Realistically, \$1.5M recurring would allow a ten-year replacement schedule and combined with the nearly \$3.7M received over the last four years, the SCL is very close to industry standards.

Allowing remote court testimony for scientists would save hundreds of hours of time, the cost of travel, and help the lab more efficiently test and return evidence, to the benefit of all stakeholders.

The Survivor Act and the increasing demands of the opioid crisis have significantly increased submissions. Additional positions and funding, as stated above, are critical to maintaining acceptable turnaround times for forensic analysis.

With continued support, the SCL will continue to provide quality and timely forensic analysis and impartial expert testimony.

Respectfully submitted December 9, 2020.

A handwritten signature in black ink that reads "Vanessa Martinucci". The script is cursive and fluid, with the first name "Vanessa" and last name "Martinucci" clearly legible.

Vanessa Martinucci
Director, North Carolina State Crime Laboratory

Appendix A - Submissions by County

	7/1/2015 to 6/30/2016		7/1/2016 to 6/30/2017		7/1/2017 to 6/30/2018		7/1/2018 to 6/30/2019		7/1/2019 to 6/30/2020	
County	Submissions	Items Submitted	Submissions	Items Submitted	Submissions	Items Submitted	Submissions	Items Submitted	Submissions	Items Submitted
Alamance	278	446	359	689	318	546	381	582	458	744
Alexander	72	142	89	259	89	142	91	246	101	140
Alleghany	30	55	13	19	29	62	34	70	52	61
Anson	65	129	55	235	56	99	108	222	85	178
Ashe	42	70	27	61	27	35	101	161	117	142
Avery	53	78	56	99	121	144	80	107	83	139
Beaufort	372	508	446	710	383	487	377	472	346	502
Bertie	24	70	56	137	83	105	57	102	39	60
Bladen	84	185	98	157	54	115	203	281	109	158
Brunswick	550	785	428	683	584	788	559	788	727	1014
Buncombe	1046	1839	1051	1890	1358	1990	1553	2125	1460	2407
Burke	335	519	455	861	466	668	467	677	415	612
Cabarrus	609	841	600	1009	718	960	639	816	786	1023
Caldwell	325	650	324	542	302	442	390	507	381	526

Camden	17	25	13	13	7	11	5	9	16	32
Carteret	447	623	412	600	426	569	290	433	406	570
Caswell	68	151	78	139	41	64	73	86	99	126
Catawba	988	1430	885	1612	1041	1600	836	1084	715	941
Chatham	126	212	118	219	128	253	205	344	135	189
Cherokee	81	133	102	175	116	144	42	55	140	280
Chowan	32	56	57	80	33	51	38	49	31	46
Clay	50	75	34	56	24	46	25	39	64	139
Cleveland	468	744	543	772	624	806	626	903	564	941
Columbus	204	391	142	292	109	155	134	214	136	216
Craven	347	675	351	599	384	726	437	748	454	788
Cumberland	247	1155	274	1186	431	841	1118	1824	1161	1911
Currituck	80	102	69	109	103	127	85	118	80	105
Dare	223	309	256	415	236	329	208	290	212	280
Davidson	330	486	435	709	551	718	610	787	510	661
Davie	85	117	88	162	108	153	121	181	125	171
Duplin	222	399	410	677	394	545	439	615	373	560
Durham	1376	4624	1066	3969	1001	3753	1236	2831	709	993
Edgecombe	253	377	206	331	280	399	371	559	364	507

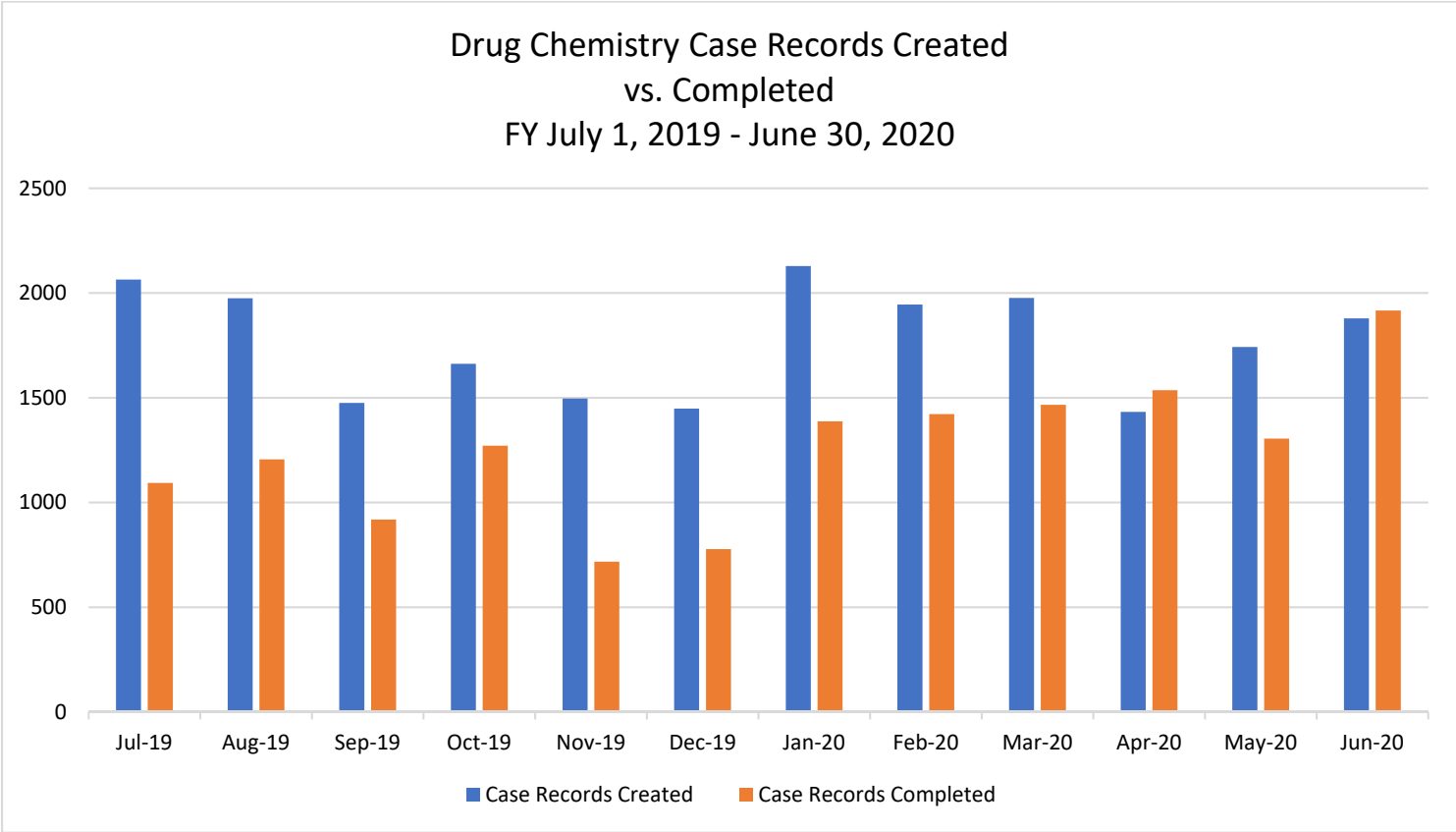
Forsyth	925	604	282	799	758	847	752	1243	834	1744
Franklin	203	569	285	751	352	621	545	784	521	764
Gaston	857	1287	1120	1675	1211	1710	1281	1765	1116	1496
Gates	10	16	9	21	21	59	4	13	23	33
Graham	41	71	32	60	44	79	42	65	67	102
Granville	257	334	246	490	306	439	240	389	279	710
Greene	76	122	44	87	47	76	45	47	60	124
Guilford	1294	1965	1375	2635	1413	2168	1742	2318	2002	2998
Halifax	181	313	242	454	163	300	212	319	273	439
Harnett	204	402	226	480	261	399	280	488	280	506
Haywood	250	384	357	515	391	619	469	692	528	769
Henderson	350	526	397	612	483	773	608	907	524	770
Hertford	54	98	52	114	125	169	75	139	78	120
Hoke	234	635	203	553	197	361	258	499	305	736
Hyde	10	20	20	28	15	19	5	9	2	2
Iredell	341	560	262	571	306	632	330	450	397	622
Jackson	152	381	188	302	242	437	327	540	337	554
Johnston	706	1098	590	952	805	1068	586	801	710	922
Jones	52	66	70	109	45	52	68	90	85	112

Lee	217	405	211	417	257	394	171	341	230	333
Lenoir	413	783	480	1027	393	725	426	640	445	643
Lincoln	566	745	501	651	443	606	541	740	378	530
Macon	128	205	172	288	166	238	202	297	240	315
Madison	38	67	116	222	122	242	140	258	101	155
Martin	188	276	213	454	152	241	110	189	88	123
McDowell	137	182	177	314	201	334	235	357	267	455
Mecklenburg	444	754	375	715	358	515	375	493	416	606
Mitchell	86	132	41	90	29	53	65	103	34	70
Montgomery	38	98	95	205	55	83	79	150	77	133
Moore	264	421	233	469	230	372	293	442	476	619
Nash	455	669	392	653	487	668	512	648	629	808
New Hanover	666	1689	829	2153	944	1762	1347	2684	1502	3051
Northampton	121	235	41	118	63	178	51	101	61	172
Onslow	513	835	576	959	768	1212	787	1175	926	1556
Orange	322	593	462	986	441	647	417	686	382	581
Pamlico	126	183	117	184	231	290	123	193	130	228
Pasquotank	122	216	210	359	205	292	201	344	239	407
Pender	76	115	144	270	80	124	104	115	181	327

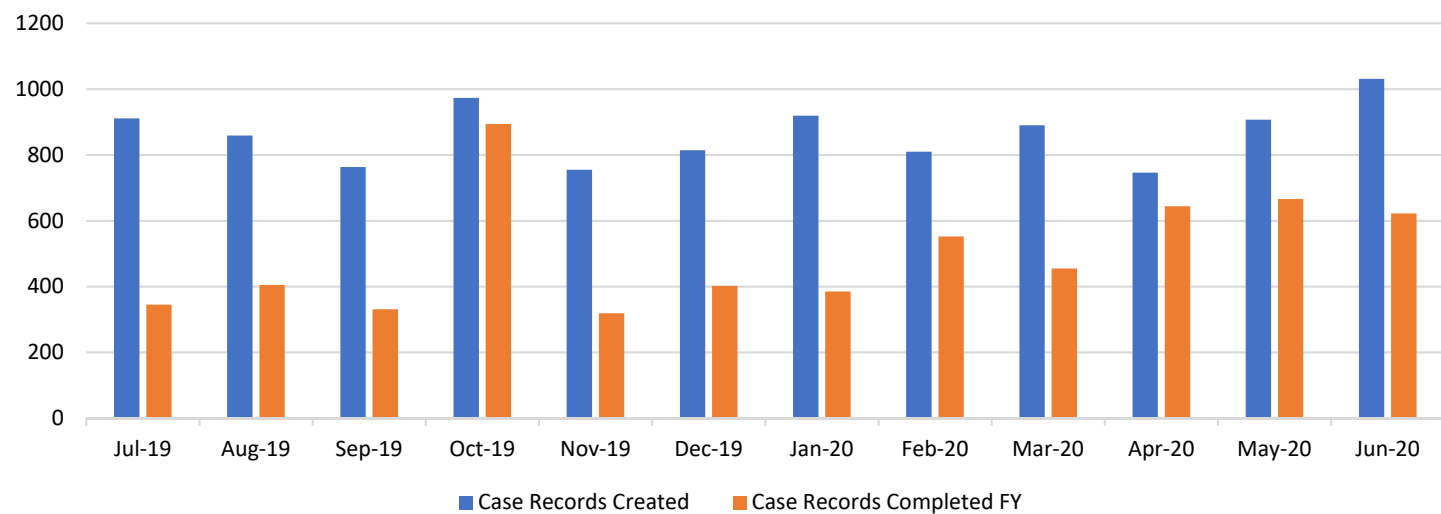
Perquimans	15	20	27	46	34	85	56	95	46	63
Person	130	166	173	246	188	231	203	270	128	220
Pitt	211	456	479	883	1032	1348	250	384	408	591
Polk	87	163	117	179	89	103	122	154	121	175
Randolph	442	691	609	935	846	1258	903	1253	834	1118
Richmond	241	447	378	701	352	591	293	456	308	581
Robeson	311	592	327	672	394	967	560	1744	543	1725
Rockingham	247	369	247	609	295	465	381	560	450	594
Rowan	578	823	587	1067	720	1159	661	1071	713	1092
Rutherford	169	290	209	373	207	276	191	253	319	454
Sampson	302	463	175	326	316	509	438	671	452	729
Scotland	179	444	156	377	154	308	169	305	252	523
Stanly	187	322	261	492	362	447	432	592	461	580
Stokes	139	228	170	328	206	269	138	191	169	233
Surry	289	486	287	590	321	411	430	622	508	680
Swain	105	156	99	186	146	209	131	181	119	159
Transylvania	128	248	114	280	120	213	136	258	108	150
Tyrrell	15	18	4	4	51	57	11	11	15	22
Union	455	702	464	835	578	743	662	869	632	843

Vance	189	340	244	518	310	539	360	596	339	591
Wake	485	1954	589	1631	560	1316	617	1262	494	1117
Warren	22	34	31	57	75	120	82	111	35	64
Washington	30	40	15	26	23	25	19	37	16	36
Watauga	133	207	160	263	169	234	172	264	174	231
Wayne	488	908	601	1132	750	1301	818	1241	864	1323
Wilkes	320	525	305	532	332	472	300	469	278	359
Wilson	435	702	516	820	471	694	693	994	746	1066
Yadkin	207	307	202	378	149	209	228	285	189	234
Yancey	99	148	79	136	70	101	89	127	86	129
TOTAL	27284	48704	28606	55830	32755	52337	35532	55165	36483	57479

Appendix B – Case Records Created vs Completed



Toxicology Case Records Created
vs. Completed
FY July 1, 2019 - June 30, 2020



Forensic Biology Case Records Created
vs. Completed
FY July 1, 2019 - June 30, 2020

