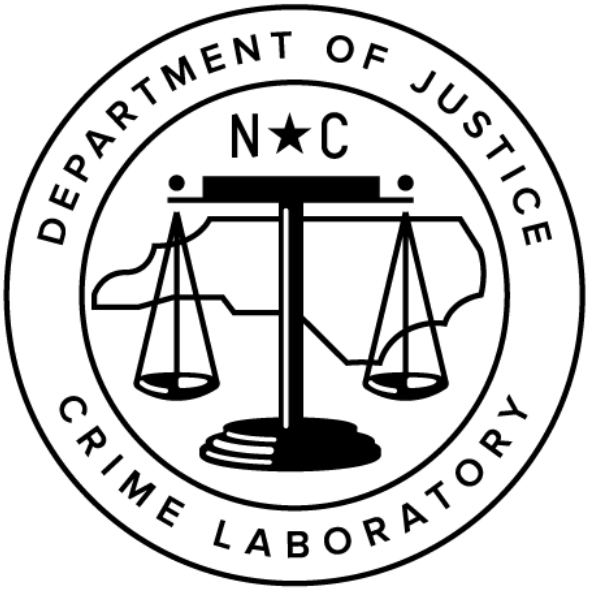
North Carolina Department of Justice

ANNUAL REPORT

FISCAL YEAR 2018-2019

North Carolina State Crime Laboratory



Director Vanessa Martinucci

October 30, 2019

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 2018-2019

Dear Members:

Pursuant to Session Law 2013-360, Section 17.2, the Department of Justice is pleased to submit the Fiscal Year 2018-2019 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/vm

Cc: William Childs, Fiscal Research Division

Executive Summary

The State Crime Laboratory (SCL) continues to provide forensic services that meet the highest quality standards possible. The SCL received ISO/IEC 17025 (2017) accreditation in May 2019 and has successfully maintained compliance with DNA Quality Assurance Standards (QAS). In 2019, the SCL celebrated 31 years of consecutive accreditation.

The SCL has worked diligently since 2013 to apply continuous process improvement principles using Lean Six Sigma methodology. The SCL 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.

The Sexual Assault Evidence Collection Kit Tracking & Inventory Management System or (STIMS) went live on October 1, 2018. Training videos are now available at www.ncdoj.gov.

Case submissions have increased by **5.6%** compared to the FY 2017-2018 and **increased** by an alarming **36% in the last three years**. That is a strong indicator of confidence by local law enforcement agencies to submit cases to the SCL knowing they will receive completed cases in shorter amounts of time without compromising quality. **Case completions, however, have decreased over the last two years.** This is due to Drugs and Toxicology making up 80% of all lab submissions and those submissions including 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. Sexual Assault Evidence Collection Kit (SAECK) submissions and Latent Evidence submissions have also complicated completion rates. In addition, court testimony continues to increase (5.62% from last year and 12.7% in the last three years) requiring scientists to be away from the lab, impacting their ability to keep pace.

Due to the passage of the Survivor Act in September 2019, the increasing demands of the opioid crisis, and the potential for increased submissions due to the Farm Act additions, the SCL is in need of additional critical resources in order to continue to meet the testing demands of law enforcement and to keep turnaround times from increasing. It's important to note that the SCL requested twelve additional positions for the 2019-2021 state budget; however, five positions were provided in the General Assembly's Budget Conference Report.

The SCL has not yet received those five positions due to the current budget impasse. Additional scientist positions are critical to close the gap between cases submitted and cases worked. As such, the SCL will be respectfully requesting additional positionsin the upcoming legislative budget session.

Finally, the SCL continues to face challenges, particularly a recurring funding source for the purchase or lease of scientific equipment, complimentary recurring increases in scientific supply funds, and the requirement that SCL scientists provide in-person court testimony. $1.5 M recurring would allow a ten year replacement schedule and combined with the nearly $3.5 M received over the last two years, the State Crime Laboratory would be very close to industry standards. A special revenue reserve fund would provide contingency funding to offset periodic reductions in crime lab court fees authorized pursuant to NCGS 7A-304 (a) (7). With continued support, the State Crime Laboratory will continue to provide quality and timely forensic analysis and impartial expert testimony.

NORTH CAROLINA STATE CRIME LABORATORY REPORT

FISCAL YEAR 2018-2019[1]

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 effective August 26, 2019 after Director John Byrd's retirement on July 1, 2019.

II. Quality (Accreditation and Certification)

Forensic services provided by the State Crime Laboratory continue to meet the highest quality standards possible. The State Crime Laboratory 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 State Crime Laboratory. During 2019, the SCL received its annual re-accreditation assessment by ANAB. During the assessment, the SCL transitioned its accreditation to meet the International Organization for Standardization/International Electrotechnical Commission (ISO/IEC) 17025:2017 standards. The SCL also was inspected by DNA Quality Assurance Standards (QAS). There were no outstanding issues identified by ANAB or the QAS assessment team.

III. Case Submissions and Completions[2]

1. Case Submissions

In FY 2018-2019, 37,997 examination requests including over 55,000 items of evidence were accepted at the SCL's three locations. (See Figure 1) This is a **5.6% increase in case examination submissions** compared to the FY 2017-2018 and a **36% increase in the last 3 years**. Including DNA Database submissions, the SCL received 60,538 submissions in FY 2018-2019.

Case submissions are broken down as follows:

- The **main State Crime Laboratory in Raleigh** received 18,560 casework submissions and 22,541 DNA Database submissions for a total of 41,101 submissions.
- The **Triad Regional Crime Laboratory** received 9,209 casework submissions.
- The **Western Regional Crime Laboratory** received 10,228 casework submissions.

[1] *This Report addresses the statutorily mandated "previous fiscal year" (July 1, 2018 - June 30, 2019), and thus only briefly mentions, when required by context, important State Crime Laboratory developments occurring on or after July 1, 2019.*

[2] *This information is provided in compliance with* S.L. *2013-360 (1) and (2) which requires that the Annual Crime Lab 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."*

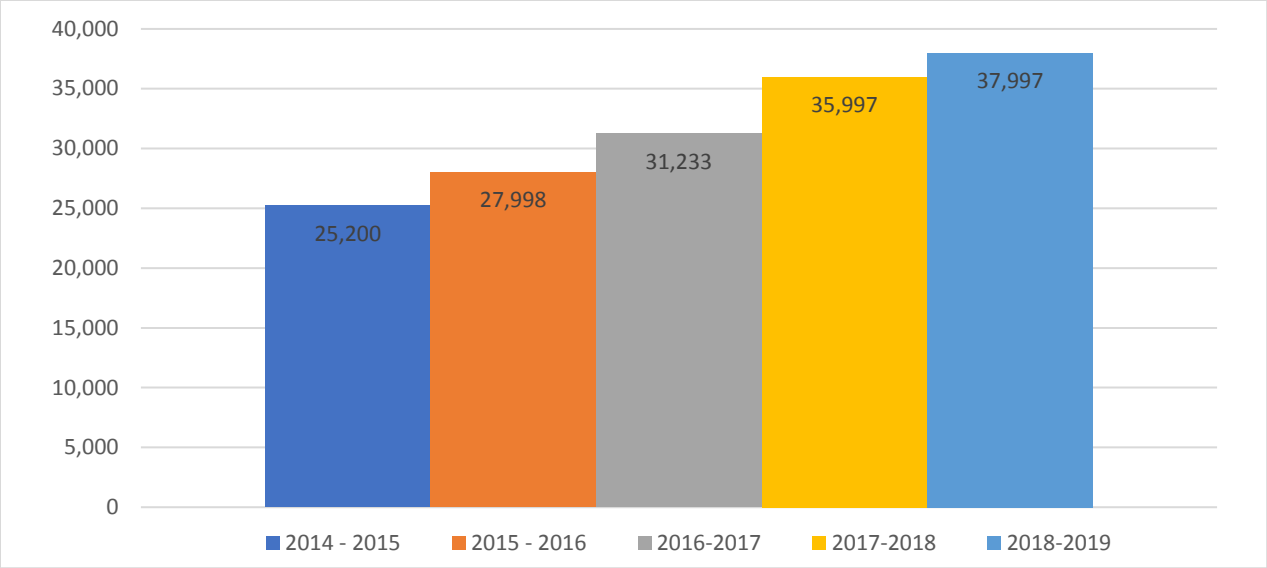


Figure 1 Annual Case Submissions

a. Case Submissions by Forensic Discipline and Lab Location

In FY 2018-2019, the State Crime Laboratory received the following cases, broken down by forensic discipline and laboratory location:

	Raleigh	Triad	Western	TOTALS
Drug Chemistry	9,675	4,477	7,278	21,430
Toxicology	3,980	2,969	2,071	9,020
Forensic Biology	2,135	649	448	3,232
Firearms	1,277	366	133	1,776
Latent Evidence	906	511	147	1,564
Trace Evidence	448	209	131	788
Digital Evidence	139	28	20	187
TOTALS	18,560	9,209	10,228	37,997

In FY 2018-2019 approximately 5,079 of the 22,541 DNA database samples received were duplicates. The number of duplicates in FY 2018-2019 was lower than FY 2017-2018. 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 2018-2019 cost approximately $30,000.** Efforts are underway to better educate the members of law enforcement on duplicate submissions including letters to agencies with a high duplicate submission rate, and providing training to the Department of Public Safety prison staff by the DNA Database Section. The DNA Database Section also partnered with Department of Justice 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 will result in another method of collecting

officers can utilize to verify the need for a new DNA sample, and enable the SCL to identify instances where a sample was not collected. To maximize taxpayer resources, the SCL 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 County[3]

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 2018-2019, scientists in the State Crime Laboratory system worked 34,824 submissions, broken down as follows:

- The **main State Crime Laboratory in Raleigh** worked 18,514 case submissions and processed 17,473 profiles for the DNA Database.
- The **Triad Regional Crime Laboratory** worked 6,420 case submissions.
- The **Western Regional Crime Laboratory** worked 9,890 case submissions.

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

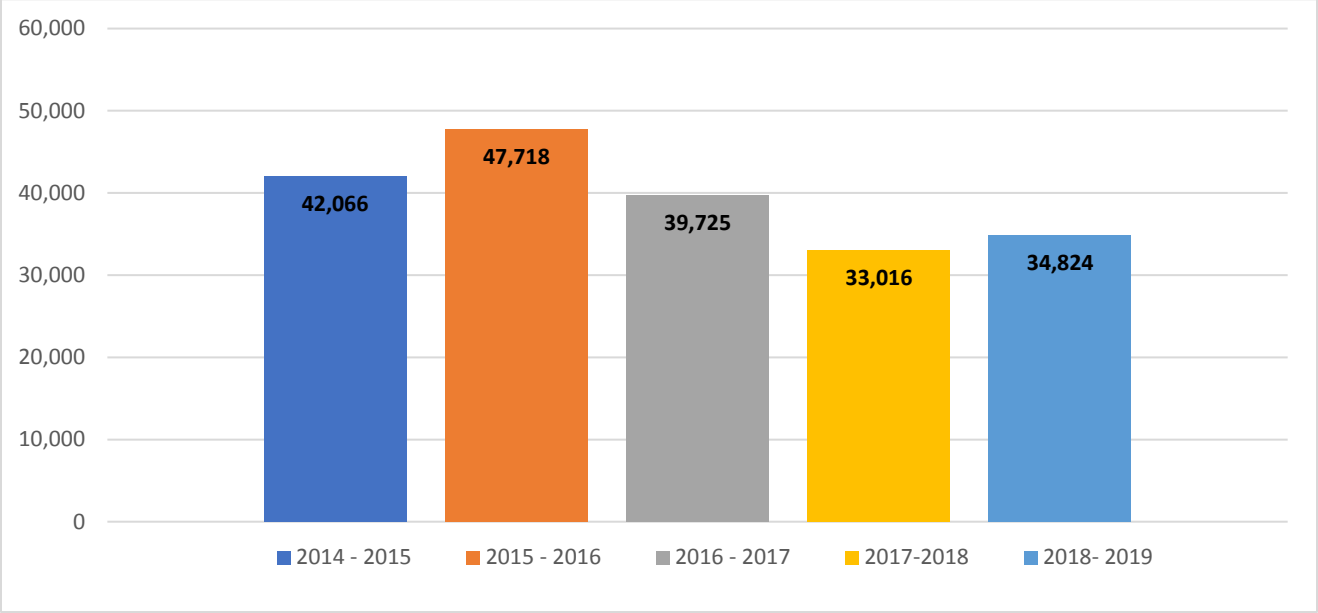


Figure 2 Annual Case Record Completions

[3]*This 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.*

a. Case Completions by Forensic Discipline and Lab Location

In FY 2018-2019, the State Crime Laboratory completed the following cases, broken down by discipline and lab location:

	Raleigh	Triad	Western	TOTALS
Drug Chemistry	8,110	3,476	6,600	18,186
Toxicology	3,851	2,673	2,178	8,702
Forensic Biology	3,609	8	800	4,417
Firearms	1,491	2	96	1,589
Latent Evidence	673	257	207	1,137
Trace Evidence	633	4	8	645
Digital Evidence	147	0	1	148
TOTALS				34,824

Total case completions have decrease by 17% since 2015. Drugs and Toxicology analysis requests make up 80% of all lab submissions and those submissions have included complex opioids such as fentanyl and fentanyl-based analogs. **These types of drugs require extensive testing, lengthening the turnaround time resulting in a decrease in the number of cases completed.**

DNA Database CODIS samples processed: Notable successes of the DNA Database Section include a **record 799 hits to the DNA database in FY 2018-2019**, which now contains more than 360,000 **DNA profiles**. New technology now allows faster input of DNA samples into the database where it can be used to identify suspects in unsolved cases.[4]

b. Lead Times[5]

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 221 days.** Lead times for individual cases vary depending on the amount of evidence submitted and the type or types of analysis requested.

c. Rush Case Program

The State Crime Laboratory continues to operate a successful rush case program to give District Attorneys the option to expedite cases when appropriate. Upon the request of a 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 District Attorneys about cases when a rush request may be needed.

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[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.

*[5] **Lead Time** is defined as the time from when the evidence is submitted to the State Crime Laboratory to when the report is published. This includes time the evidence sits in the lab 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.*

d. Court Testimony and Judicial Efficiencies

During FY 2018-2019, the SCL continued to feel the effects of the 2009 U.S. Supreme Court ruling in *Melendez-Diaz v. Massachusetts* that requires forensic scientists to provide live, in-court testimony rather than testifying by sworn affidavit. More time spent by scientists in court or traveling to court means less time in the lab working on cases.

In FY 2018-2019, SCL scientists spent a total of **4,983** hours traveling to court, waiting to testify or testifying. This is an **increase of 1,286 hours or 35%** from FY 2017-2018. Of those hours, SCL scientists spent 3,178 hours traveling to court, 1,365 **hours waiting to testify**, and 440 hours testifying. (See Figure 3.) **Assistance is still needed from our criminal justice stakeholders to minimize the time forensic scientists spend in court and away from the lab.** 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.

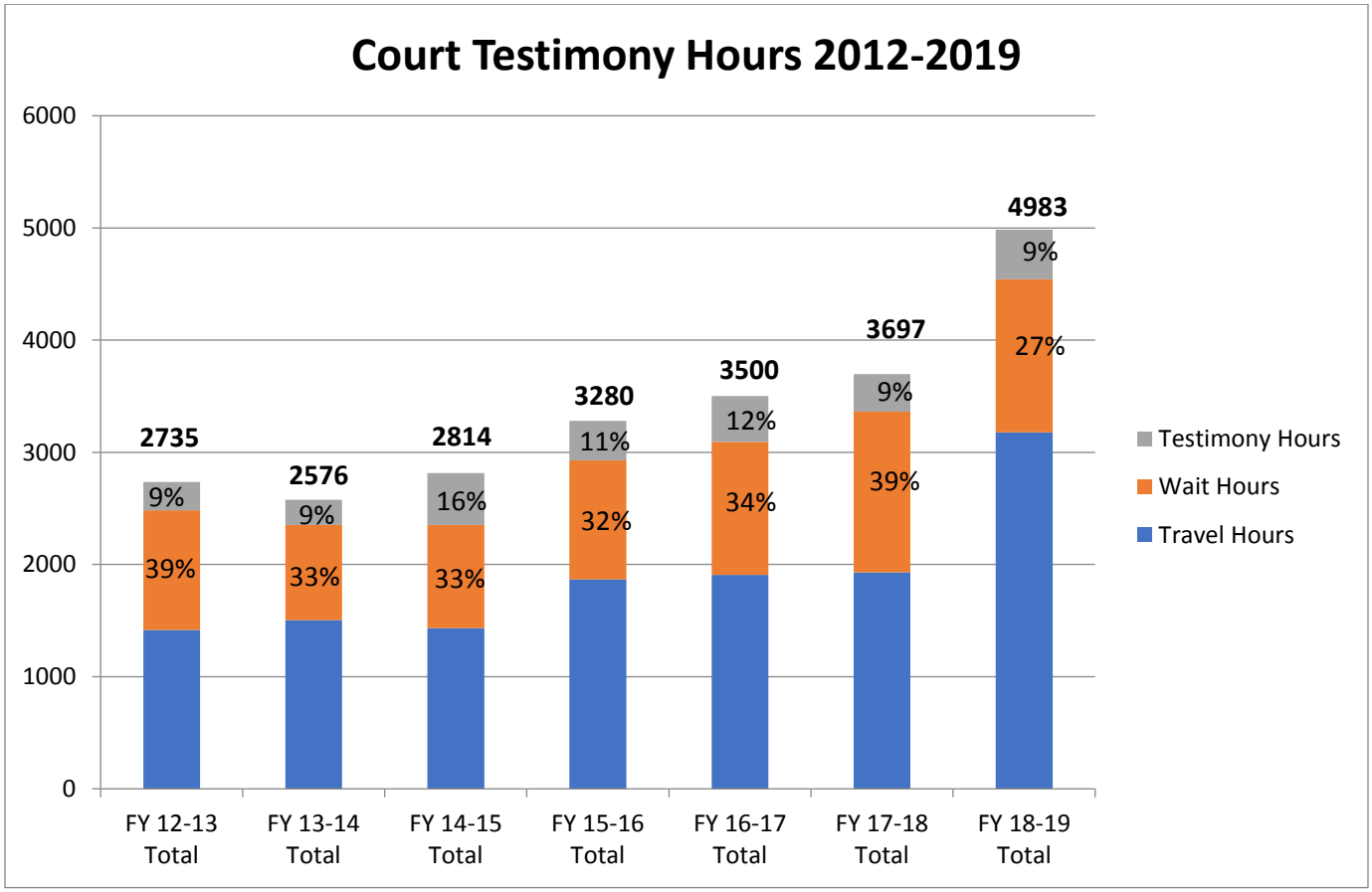

Figure 3 Court Testimony Hours 2012-2019

Nearly half of all Judicial Districts in North Carolina agreed to adopt the recommendations from the School of Government report. **The State Crime Laboratory 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 lab.**

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

Section 17.7 of Session Law 2017-57 included language directing each local law enforcement agency to conduct an inventory of untested Sexual Assault Evidence Collection Kits (SAECKs) in its custody or control and report its findings to the State Crime Laboratory no later than January 1, 2018. The DOJ and the State Crime Laboratory reported to the legislature its findings on March 1, 2018. This legislatively mandated inventory indicated there were 15,160 untested SAECKs in NC.

The Working Group on Sexual Assault Kits recommended that all kits be tested, in keeping with legislative intent. The full Working Group provided a report to Attorney General Stein, which served as the basis for his drafting of the Standing Up For Rape Victims Act Of 2019, or Survivor Act, (House Bill 29 and Senate Bill 46) which adopted all of the Working Group's recommendations. House Bill 29 was passed into law in September of 2019. The impact the law will have on the SCL includes: 1) the requirement to track the outcome as reported by law enforcement of all CODIS Hits and the 2) increased submissions of newly collected SAECKS.

NCDOJ and the SCL have spearheaded an initiative to test previously untested SAECKs located in law enforcement agencies throughout the state. To assist with this endeavor, DOJ/SCL secured $2M in funding from the Bureau of Justice Assistance Sexual Assault Kit Initiative (SAKI) and $2M in funding from the Victims of Crime Act (VOCA) via the Governor's Crime Commission to help cover the costs associated with the identification and testing of SAECKs. The Survivor Act added an additional $6M to aid in the testing of remaining SAECKS.

A SAKI site coordinator has been hired to direct the identification of all previously untested SAECKs. To assist in this endeavor a team of temporary employees has been hired to travel to law enforcement agencies throughout the State. This team provides instruction on how to access the SAKI data collection tools to log every untested SAECK in the agency's custody and to certify the agency's SAECK inventory. Once the SAECKs have been entered, the information is uploaded into the Sexual Assault Evidence Collection Kit Tracking and Information Management System (STIMS).

The SCL then works with the agencies via a SAECK outsourcing project that uses approved vendor laboratories for testing. The Forensic Biology Section receives requests from agencies for SAECK testing, reviews the evidence listings and case details to determine if the case will be CODIS eligible should a DNA profile be generated, and approves the case for submission 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 reviews qualifying data from the vendor laboratories for upload into CODIS.

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** which appear to have cleared the court system but for which the SCL has not received a disposition notice, requesting confirmation that the case is completed and that no further lab 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 NCDOJ'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 SCL providing lists.**

The SCL partnered with SAS and GDAC on a second project to create an automated case search that cross references court and State criminal databases (CJLEADS, etc.) and the SCL's case management system. The purpose of this partnership is to automate the identification of cases that meet statutory requirements for disposal. This automated report has helped eliminate the number of adjudicated DWI blood tubes in SCL custody and ease the burden for investigating agencies to refrigerate cases after analysis. The State Crime Laboratory has successfully been able to dispose of 10,417 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 State 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 2018-2019, there were 15 hires, 13 resignations, 0 terminations and 2 retirements. **Of special note, in June 2018 when the State's new classification and compensation system became effective, the State Crime Laboratory lost the Special Minimum Rate (SMR) for Forensic Scientist I's originally established in July 2015 to assist with hiring and retention of highly qualified Forensic Scientist Is. The removal of the SMR created inequity for new hires to the SCL.** The State Crime Laboratory had a 15.56% vacancy rate 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.

Another concern of the SCL 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 4 vacancies and cannot currently recruit and maintain qualified candidates due to the pay differential with the private sector.

VI. Fiscal Resources[6]

At the beginning of calendar year 2014, the State Crime Laboratory 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 NC State Crime Laboratory is comparable to other like-size, publically 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.)

[6] *S.L. 2013-360 (4) also provides that the Annual Crime Lab 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 SCL 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 2018-2019 State Crime Laboratory Annual Report is the third year in which a full year of data reflecting a comparative breakdown of analysis costs is being addressed.*

Project FORESIGHT Annual Report, 2017-2018 Cost per Item by Investigative Area				
Area of Investigation	**25th percentile**	**Median**	**75th percentile**	**NC SCL**
Toxicology ante mortem (excluding BAC)	$563	$710	$963	$ 878
Blood Alcohol	$102	$149	$199	$ 61
Digital evidence	$708	$1,334	$4,215	$ 3,786
DNA Casework	$363	$414	$706	$ 439
DNA Database	$41	$55	$85	$ 165
Drugs - Controlled Substances	$136	$194	$222	$ 187
Fingerprints	$233	$362	$521	$ 414
Fire analysis	$546	$805	$1,196	$ 247
Firearms and Ballistics	$471	$804	$1,091	$ 196
Gun Shot Residue (GSR)	$1,190	$1,511	$2,041	$ 187
Marks and Impressions (Shoe prints/tire tracks)	$1,967	$2,461	$3,164	$ 1,174
Serology/Biology	$215	$275	$505	$ 95
Trace Evidence	$37	$63	$83	$ 1,126

Figure 4 Project FORESIGHT Annual Report, 2017-2018 National Percentile for Cost per Item 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 four years, the State Crime Laboratory's **supply costs have also increased**. During FY 2018-2019, the State Crime Laboratory expended over $1.76 M on scientific supplies of which 70% was DNA-related. Specifically, $1,229,800 was expended on DNA, while $534,193 was expended on non-DNA disciplines. (See Figure 5). Of that amount, **27% or $471,620 (increased from 24% or $432,890 in FY 2017-2018) was from General Appropriations** and the remaining **73% or $1,292,704 (decreased from 76% or $1,349,907 from FY 2017-2018) was from DNA Grant funding**. (See Figure 6).

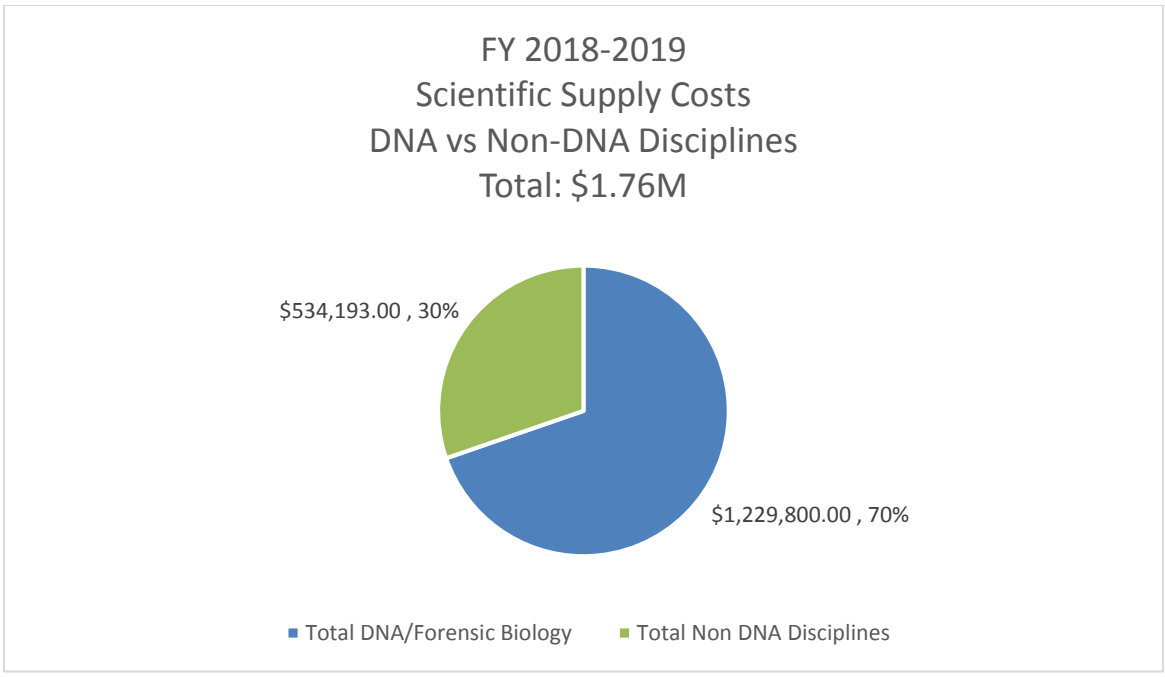

Figure 5 FY 2018-2019 Scientific Supply Costs

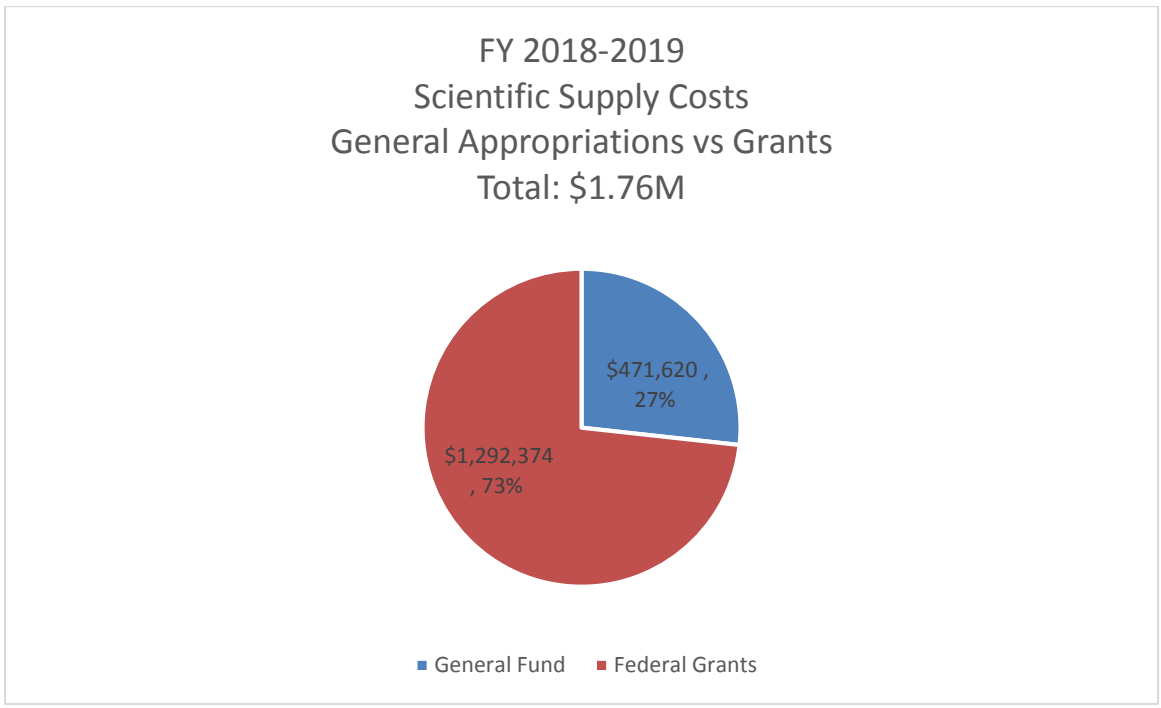

Figure 6 FY2018-2019 Scientific Supply Funds from General Appropriations vs Grants

During FY 2018-2019, the SCL had active funding from various federal grants totaling over $11 M. 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. With the receipt of this grant money, **the Laboratory is in need of a dedicated business officer and is respectfully requesting one business officer, FTE (R), specific to the SCL who would work under the direction of DOJ Financial Services to ensure all SCL grant needs and as appropriate, other DOJ grant needs, are met in a timely manner.**

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 $14.3 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 $3.5 M received over the last two years, the State Crime Laboratory would be very close to industry standards. A special revenue reserve fund would provide contingency funding to offset periodic reductions in crime lab court fees authorized pursuant to NCGS 7A-304 (a) (7).

VII. Expansion

The State Crime Laboratory continued to expand its services, replaced outdated equipment, and conducted significant analysis to determine the future needs within each of the disciplines. Some examples are noted below.

Forensic Biology and the DNA Database sections continue to expand forensic analysis services. The SCL now has the capability to provide kinship testing. This type of testing is beneficial in missing person cases or investigations in which criminal paternity is in question. The SCL is also in the final validation stages to implement a familial search program. Cases like the "Golden State Killer" brought national attention to the capabilities of this form of database searching. The SCL hopes to implement familial searching using Y-STR methods (*male lineage, or Y-chromosomal*) in late 2019. Finally, the SCL is validating probabilistic genotyping software (STRmix) to aid in the complex nature of DNA mixture interpretation. The Section is targeting to be online with probabilistic genotyping in early 2020.

The State Crime Laboratory expanded capabilities to the Western Counties by providing entries and uploads to the National Integrated Ballistic Information Network (NIBIN). 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 Western Regional Laboratory purchased and installed a terminal in FY 2018-2019, giving western NC counties a local resource previously only available at the State level at the Raleigh Laboratory.

The State Crime Laboratory was awarded grant funding for Toxicology and is currently validating methods for Q-TOF instrumentation which will be utilized to screen for over two hundred different drugs. Validations and determination of levels of detection are expected to be completed by December 2019. 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 2019.

At a strategic level, the SCL is implementing a "dashboard" system in 2019-2020 which will monitor Laboratory casework by discipline and other functions (court testimony, laboratory submissions, etc.) at an automated level. The purpose is to have data available continuously and discontinue the need for man-hours spent pulling data manually.

The SCL is requesting additional scientists during the next legislative session to meet the demands of case submissions within the scientific disciplines.

As stated earlier, case submissions to the SCL have increased 36% over the past three years. This is a strong indicator of the confidence that law enforcement has with the SCL. However, under our current scientist staffing level, the SCL is unable to meet this demand as exhibited by more cases submitted in FY 18-19 (37,997) than worked during FY 18-19 (34,824). Adding to this is the fact that a majority of Drug and Toxicology submissions now include complex opioids such as fentanyl and fentanyl-based analogs. These types of drugs require extensive – complicated testing that lengthen turnaround times. Moreover, due to the recent passage of the Survivor Act (S.L. 2019-221) and the recent closing of local fingerprint testing laboratories – both sexual assault kit evidence and fingerprint evidence make up the additional categories of submissions that continue to grow.

To close the gap between cases submitted and cases worked we will be requesting additional positions, both scientists and supervisors, in the upcoming legislative session in the disciplines of Forensic Biology, Drug Chemistry, and Latent evidence. It is important to note we requested funding during the 2018-2019 legislative session to secure twelve (12) additional positions, however only five (5) were provided in the General Assembly's 2019-2021 Budget Conference Report. Without an approved State Budget for 2019-2021 the SCL has not received those five.

These additional positions are critical. Additional Forensic Biology analysts 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.

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%. Thus, for example, four additional scientists would reduce turnaround time by an estimated 20%.

Finally, for Latent evidence, adding additional Latent analysts will enable the section to process and compare cases with a more efficient turnaround time. The analyst will: 1. work cases submitted from LEAs that contain latent lifts comparisons, 2. perform SAFIS search request, 3. conduct CODIS Hit verifications, 4. issue reports and testify as needed, 5. perform case work reviews, and 6. assist in processing of crime scenes and mass causality/disaster scenes when requested. Once trained (which takes approximately 9-12 months) a latent analyst will be able to work 100 cases a year. The current turnaround time for latent evidence is 141 days. For every additional analyst hired, turnaround would be reduced by 10 days. Thus, for example, with the addition of two additional scientists– turnaround time would drop to an estimated 121 days from 141.

<u>SB 315 – Farm Act of 2019</u>

The North Carolina Farm Act of 2019 (Senate Bill 315) which legalizes smokeable hemp, poses significant challenges for the SCL. Presently, the SCL only tests samples in connection with possession of felony cases of marijuana. This equates to around 1,000 case submissions annually. The reason for this is that currently, the court relies on the officer's testimony as to their sight and smell of the controlled substance to hold the substance seized was, in fact,

marijuana. Therefore, prosecutors rely on the officer's testimony for misdemeanor quantities and only send samples to the SCL when the defendant is facing felony charges such as trafficking. However, given that smokeable hemp is indistinguishable from marijuana, the SCL predicts a spike in submissions from law enforcement requesting the SCL to determine whether the substance seized was, in fact, marijuana and not smokeable hemp.

The SCL faces two challenges: 1. the equipment needed to differentiate between smokeable hemp and marijuana and 2. the resources required to address the spike in submissions.

The SCL does not have the ability to differentiate between different levels of THC – only the ability to identify that THC is present in the items provided. Thus, in a world where smokeable hemp is legal and marijuana is illegal, the SCL will require additional instrumentation in order to be able to differentiate between the two by being able to measure the amount of THC found in the sample. The instrumentation that is needed to accomplish this is called Liquid Chromatography- tandem Mass Spectrometry. The SCL would need one instrument at each lab (Raleigh, Triad, and Western locations). The cost to purchase this instrumentation is $1M total. The SCL would also need $150,000 recurring for the maintenance costs and supplies for the three instruments. Additionally, it would take the SCL a year to prepare the instruments which include procurement, installation, validation, and training. Therefore, during this time, all samples sent to the SCL would need to be outsourced.

The second challenge is the resources needed to address the spike in submissions. The first year would require that all submissions be outsourced for testing while the instruments are procured and validated, and all scientists are trained. The SCL would also need additional Forensic Scientist positions to meet the influx of cases. In surveying other states that have addressed this issue the SCL found that Tennessee saw an increase of 50% to 12,000 cases, Florida saw an increase of 140% in plant material identifications and a 334% increase in THC identifications (oils and other CBD products) and is on track to see over 2,000 plant material cases and 1,100 THC oil/product cases for 2019.

Should the bill's language as it currently reads stand, with the good faith amendment intact (Section 11.5(a1)), the SCL anticipates seeing an additional 1,000 cases being submitted, which would be 2,000 cases annually. Under this scenario, we believe law enforcement will continue to only submit cases that deal with felony possession of marijuana. The cost to outsource an item is $600. Therefore, to outsource 2,000 cases while the instrumentation is coming online would be $1,200,000. This would be one-time request for outsourcing money if the SCL receives the appropriate instruments to conduct the analysis in-house.

The SCL would also need additional scientists to meet the spike in submissions. One Forensic Scientist in the Drug Chemistry discipline can work 300 cases/annually. As a result of the anticipated increase in submissions, the SCL would need 6 new Forensic Scientists which would cost $500,000 on a recurring basis. These new positions are critical in order to prevent the SCL from being bogged down with cannabis submissions causing turnaround times to balloon and preventing law enforcement from prosecuting cases in a timely manner. The SCL would also need $70,000 on a recurring basis for one new Chemistry Technician position. This new position would handle the laboratory's role in the outsourcing of the misdemeanor submissions, so that the Forensic Scientists can focus on working cases internally at the laboratory.

In summary, should SB 315 become law, the SCL will need $3.3M (NR) for new instrumentation (3 LC/MS/MS instruments), outsourcing of testing, and testimony fees. In addition, $650k (R) will be needed to hire additional personnel (6 scientists) and cover instrument maintenance and supplies.

Total SCL Farm Act Request			Amount
Instruments (NR)			$ 1,000,000.00
Maintenance and Supplies (R)			$ 150,000.00
Personnel (R)			$ 500,000.00
Outsourcing (NR)			$ 1,200,000.00
Testimony Fees (NR)			$ 470,000.00
Total:			$ 3,320,000.00

VIII. Conclusion

The SCL has worked over four years to gain continuous process improvements 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 in 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, $1.5 M recurring would allow a ten-year replacement schedule and combined with the nearly $3.5 M received over the last two years, the SCL is very close to industry standards.

The Survivor Act, the increasing demands of the opioid crisis, and the increase in fingerprint submissions combined with the limited resources of the SCL require additional resources to maintain acceptable turn-around times for forensic analysis. To close the gap between cases submitted and cases worked, additional positions are critical.

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

Respectfully submitted October 15, 2019.

Vanessa Martinucci
Director, North Carolina State Crime Laboratory

Appendix A - Submissions by County

County	7/1/2014 to 6/30/2015		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	
	Submissions	Items Submitted	Submissions	Items Submitted	Submissions	Items Submitted	Submissions	Items Submitted	Submissions	Items Submitted
Alamance	267	445	278	446	359	689	318	546	381	582
Alexander	46	93	72	142	89	259	89	142	91	246
Alleghany	34	42	30	55	13	19	29	62	34	70
Anson	63	153	65	129	55	235	56	99	108	222
Ashe	29	69	42	70	27	61	27	35	101	161
Avery	76	113	53	78	56	99	121	144	80	107
Beaufort	371	507	372	508	446	710	383	487	377	472
Bertie	33	51	24	70	56	137	83	105	57	102
Bladen	110	149	84	185	98	157	54	115	203	281
Brunswick	437	614	550	785	428	683	584	788	559	788
Buncombe	897	1,416	1,046	1,839	1,051	1,890	1,358	1,990	1,553	2,125
Burke	258	459	335	519	455	861	466	668	467	677
Cabarrus	571	789	609	841	600	1,009	718	960	639	816
Caldwell	325	529	325	650	324	542	302	442	390	507
Camden	21	29	17	25	13	13	7	11	5	9
Carteret	320	464	447	623	412	600	426	569	290	433
Caswell	47	62	68	151	78	139	41	64	73	86
Catawba	652	1,133	988	1,430	885	1,612	1,041	1,600	836	1,084
Chatham	133	233	126	212	118	219	128	253	205	344
Cherokee	55	113	81	133	102	175	116	144	42	55
Chowan	53	81	32	56	57	80	33	51	38	49
Clay	40	72	50	75	34	56	24	46	25	39

County	7/1/2014 to 6/30/2015		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	
	Submissions	Items Submitted	Submissions	Items Submitted	Submissions	Items Submitted	Submissions	Items Submitted	Submissions	Items Submitted
Cleveland	330	477	468	744	543	772	624	806	626	903
Columbus	203	336	204	391	142	292	109	155	134	214
Craven	268	590	347	675	351	599	384	726	437	748
Cumberland	497	1,023	247	1,155	274	1,186	431	841	1,118	1,824
Currituck	50	99	80	102	69	109	103	127	85	118
Dare	240	385	223	309	256	415	236	329	208	290
Davidson	326	441	330	486	435	709	551	718	610	787
Davie	99	135	85	117	88	162	108	153	121	181
Duplin	180	338	222	399	410	677	394	545	439	615
Durham	1,299	3,806	1,376	4,624	1,066	3,969	1,001	3,753	1,236	2,831
Edgecombe	328	442	253	377	206	331	280	399	371	559
Forsyth	501	980	925	604	282	799	758	847	752	1,243
Franklin	144	364	203	569	285	751	352	621	545	784
Gaston	751	1,151	857	1,287	1,120	1,675	1,211	1,710	1,281	1,765
Gates	14	15	10	16	9	21	21	59	4	13
Graham	36	107	41	71	32	60	44	79	42	65
Granville	267	408	257	334	246	490	306	439	240	389
Greene	73	139	76	122	44	87	47	76	45	47
Guilford	1,301	1,993	1,294	1,965	1,375	2,635	1,413	2,168	1,742	2,318
Halifax	222	405	181	313	242	454	163	300	212	319
Harnett	339	514	204	402	226	480	261	399	280	488
Haywood	292	404	250	384	357	515	391	619	469	692
Henderson	275	443	350	526	397	612	483	773	608	907

County	7/1/2014 to 6/30/2015		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	
	Submissions	Items Submitted	Submissions	Items Submitted	Submissions	Items Submitted	Submissions	Items Submitted	Submissions	Items Submitted
Hertford	73	97	54	98	52	114	125	169	75	139
Hoke	195	652	234	635	203	553	197	361	258	499
Hyde	5	9	10	20	20	28	15	19	5	9
Iredell	302	507	341	560	262	571	306	632	330	450
Jackson	145	332	152	381	188	302	242	437	327	540
Johnston	647	1,110	706	1,098	590	952	805	1,068	586	801
Jones	56	73	52	66	70	109	45	52	68	90
Lee	218	462	217	405	211	417	257	394	171	341
Lenoir	394	661	413	783	480	1,027	393	725	426	640
Lincoln	221	367	566	745	501	651	443	606	541	740
Macon	127	196	128	205	172	288	166	238	202	297
Madison	48	80	38	67	116	222	122	242	140	258
Martin	172	294	188	276	213	454	152	241	110	189
McDowell	124	213	137	182	177	314	201	334	235	357
Mecklenburg	354	499	444	754	375	715	358	515	375	493
Mitchell	31	53	86	132	41	90	29	53	65	103
Montgomery	38	76	38	98	95	205	55	83	79	150
Moore	228	340	264	421	233	469	230	372	293	442
Nash	420	616	455	669	392	653	487	668	512	648
New Hanover	537	1,247	666	1,689	829	2,153	944	1,762	1,347	2,684
Northampton	38	101	121	235	41	118	63	178	51	101
Onslow	449	698	513	835	576	959	768	1,212	787	1,175

County	7/1/2014 to 6/30/2015		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	
	Submissions	Items Submitted	Submissions	Items Submitted	Submissions	Items Submitted	Submissions	Items Submitted	Submissions	Items Submitted
Orange	384	755	322	593	462	986	441	647	417	686
Pamlico	79	108	126	183	117	184	231	290	123	193
Pasquotank	113	192	122	216	210	359	205	292	201	344
Pender	70	105	76	115	144	270	80	124	104	115
Perquimans	43	74	15	20	27	46	34	85	56	95
Person	162	218	130	166	173	246	188	231	203	270
Pitt	237	394	211	456	479	883	1,032	1,348	250	384
Polk	79	125	87	163	117	179	89	103	122	154
Randolph	338	546	442	691	609	935	846	1,258	903	1,253
Richmond	214	354	241	447	378	701	352	591	293	456
Robeson	281	588	311	592	327	672	394	967	560	1,744
Rockingham	254	392	247	369	247	609	295	465	381	560
Rowan	385	616	578	823	587	1,067	720	1,159	661	1,071
Rutherford	121	204	169	290	209	373	207	276	191	253
Sampson	272	424	302	463	175	326	316	509	438	671
Scotland	119	270	179	444	156	377	154	308	169	305
Stanly	192	319	187	322	261	492	362	447	432	592
Stokes	108	166	139	228	170	328	206	269	138	191
Surry	312	462	289	486	287	590	321	411	430	622
Swain	60	110	105	156	99	186	146	209	131	181
Transylvania	76	144	128	248	114	280	120	213	136	258

County	7/1/2014 to 6/30/2015		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	
	Submissions	Items Submitted	Submissions	Items Submitted	Submissions	Items Submitted	Submissions	Items Submitted	Submissions	Items Submitted
Tyrrell	31	34	15	18	4	4	51	57	11	11
Union	349	498	455	702	464	835	578	743	662	869
Vance	147	279	189	340	244	518	310	539	360	596
Wake	263	921	485	1,954	589	1,631	560	1,316	617	1,262
Warren	37	98	22	34	31	57	75	120	82	111
Washington	21	55	30	40	15	26	23	25	19	37
Watauga	148	243	133	207	160	263	169	234	172	264
Wayne	377	675	488	908	601	1,132	750	1,301	818	1,241
Wilkes	257	381	320	525	305	532	332	472	300	469
Wilson	413	807	435	702	516	820	471	694	693	994
Yadkin	88	138	207	307	202	378	149	209	228	285
Yancey	60	101	99	148	79	136	70	101	89	127
TOTAL	**23,785**	**42,090**	**27,284**	**48,704**	**28,606**	**55,830**	**32,755**	**52,337**	**35,532**	**55,165**