North Carolina Department of Justice

ANNUAL REPORT

FISCAL YEAR 2022-2023

North Carolina State Crime Laboratory

January 19, 2024

Senator Danny Britt
Representative Ted Davis, Jr.
Representative Carson Smith
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 2022-2023

Dear Members:

Pursuant to Session Law 2013-360, Section 17.2, the Department of Justice is pleased to submit the Fiscal Year 2022-2023 Annual Report for the North Carolina 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 and my apologies for our delay in sending this report. We would be happy to respond to any questions you may have.

Sincerely,

Seth Dearmin
Chief of Staff

Cc: Mark White, Fiscal Research Division
Morgan Weiss, Fiscal Research Division

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 2023, the SCL will celebrate 35 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.

We are extremely grateful for the four scientists included in the 2022-2023 budget. However, given current market competition, we are continuing to have difficultly filling positions and retaining qualified staff. We are respectfully requesting an appropriated recurring salary adjustment fund to address recruitment and retention needs for the Forensic Scientist series, including salary increases and promotional opportunities**.** This fund will allow us to offer more competitive salaries, fill current vacancies more quickly, and retain our forensic scientists. Each time a scientist resigns, the Laboratory spends approximately $100,000 to train a new employee to fill the vacated position. In FY 2021-2022 alone, approximately 30 people were trained to fill open scientist positions – equating to $3M of state funds that were spent to pay employees who are not yet contributing to the pending caseload. In FY 2022-23, approximately 20 scientists completed training which equates to an additional $2M of state funds. During this time period, no evidence was analyzed by those analysts. This figure does not include the monetary loss of time set aside by current employees to train the new hires. This resulted in a loss of $5M over two years while incurring a strain on the system to complete training of analysts. A recurring salary adjustment fund would help to retain employees who have historically left for higher paying salaries and will give the state a larger return on investment.

The SCL is grateful for the addition of a $1M recurring equipment fund in the FY 2022-2023 budget. To-date, the State Crime Laboratory is in the process of procuring scientific instruments and equipment with this funding to further aid in technological advances as well as replace outdated and failing equipment. These purchases include, but are not limited to, RAPID DNA technology instrumentation[1], replacement of a distilled water filtration system, a hydrogen generator used in the analysis of DWI casework, and digital cameras for latent print examination. Such instrumentation and equipment are critical to casework in multiple disciplines within the laboratory system.

With continued support, the State Crime Laboratory will continue to provide quality and timely forensic analysis and impartial expert testimony for the benefit of North Carolina's criminal justice system.

[1] *RAPID DNA Technology instruments have the ability to develop a profile using a single piece of equipment within approximately two hours. This technology is mostly utilized in the field or in booking stations. The FBI is in the processes of developing standards and policies for its use to analyze crime scene samples.*

NORTH CAROLINA STATE CRIME LABORATORY REPORT

FISCAL YEAR 2022-2023[2]

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

The lab remains dedicated to ensuring that all operations are focused on achieving the mission to conduct the highest quality, technically proficient forensic analysis in a timely manner and provide impartial expert witness testimony.

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. The Laboratory was assessed in April of 2023, by ANAB, using ISO/IEC 17025:2017 standards, the FBI Quality Assurance Standards for Forensic DNA Testing Labs, and the FBI Quality Assurance Standards for DNA Databasing Laboratories. As a result of the assessment, ANAB renewed the Lab's accreditation in the Field of Forensic Testing.

III. Case Submissions and Completions[3] and Pending Case Load

1. Case Submissions

In FY 2022-2023, **43,317** examination submissions, including over **58,837** items of evidence (See Appendix A), were accepted at the SCL's three locations. This is a 6.7 % increase in submission from last year, driven by the increase in sexual assault kit submissions.

Case submissions are broken down as follows:

- The **main SCL in Raleigh** received 20,450 case record submissions and 16,206 DNA Database submissions for a total of 36,656 submissions.
- The **Triad Regional Crime Laboratory** received 9,912 case record submissions.
- The **Western Regional Crime Laboratory** received 12,955 case record submissions.

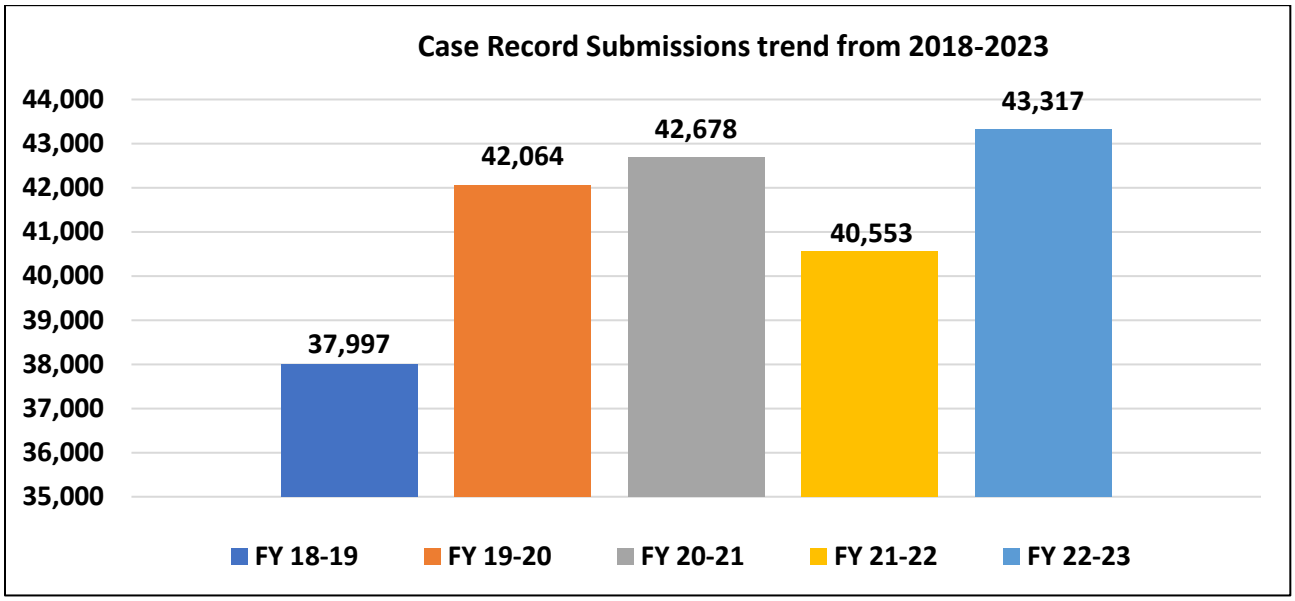
[2] *This Report addresses the statutorily mandated "previous fiscal year" (July 1, 2022 - June 30, 2023), and thus only briefly mentions, when required by context, important Crime Lab developments occurring on or after July 1, 2023.*

[3] *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."*

a. Case Submissions by Forensic Discipline and Laboratory Location

In FY 2022-2023, the SCL received the following cases, broken down by forensic discipline and laboratory location:

	Raleigh	Triad	Western	TOTALS
Drug Chemistry	8,388	4,718	7,733	20,839
Toxicology	3,839	2,308	2,450	8,597
Forensic Biology	4,114	1,402	1,114	6,630
Firearms	1,431	344	725	2,500
Latent Evidence	346	192	298	836
Trace Evidence	2,113	933	628	3,674
Digital Evidence	219	15	7	241
TOTALS	**20,450**	**9,912**	**12,955**	**43,317**



DNA Database Arrestee and Convicted Offender Submission:

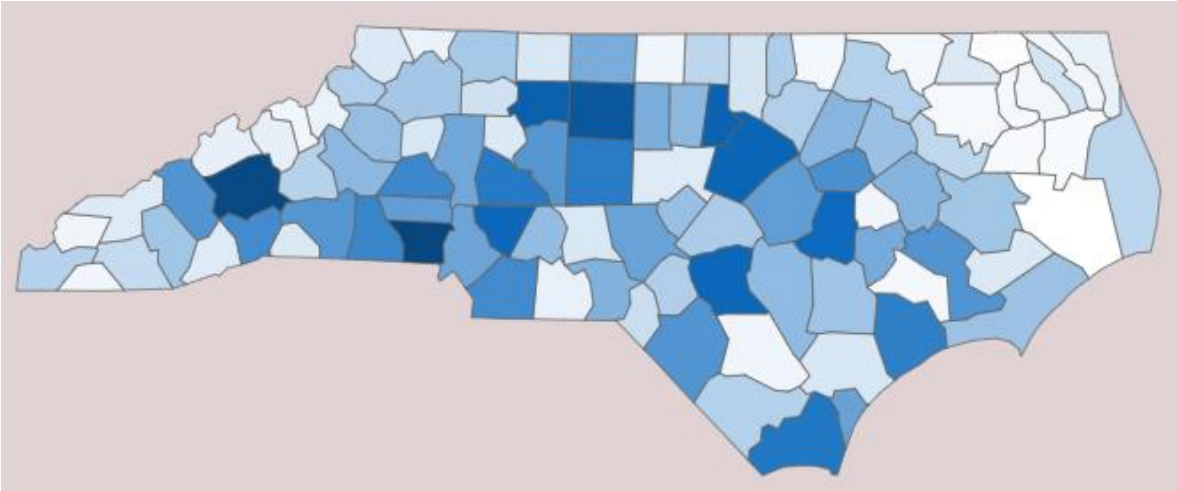
In FY 2022-2023 approximately 2,747 of the samples submitted were duplicate samples. The number of duplicates (an additional sample from the same individual) has decreased by almost 50% since FY 2017-2018. However, duplicate submissions and improper use of kits during collection continues to impact the DNA Database Section. The Laboratory pays approximately $6.00 per kit (including postage cost), which are provided to law enforcement agencies at no cost. The duplicates submitted in FY 2022-2023 cost approximately $16,000. There have been ongoing efforts 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 of collecting that 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 County[4]

Evidence item submission data for the past five fiscal years per North Carolina County may be found in Appendix A. Here is a chart to display these submissions by case record[5]; the lighter color represents the fewest submissions, and the darker blue represents the most.

Heat Map showing Distribution of Submissions by County FY 2022-2023



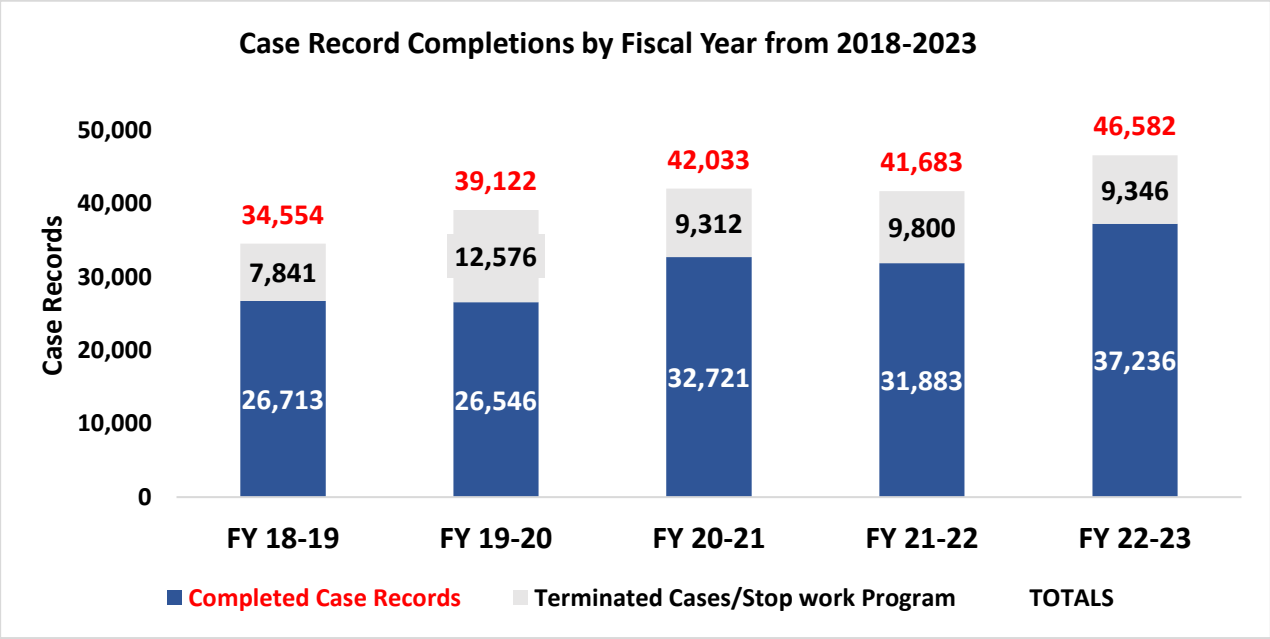
[4]*This information is provided in compliance with S.L. 2013-360 (3) which requires that the Annual Crime Lab Report contain "A breakdown by county of the number of submissions received by the Laboratory in the previous fiscal year." The numbers in these tables do not include Convicted Offender or DNA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

[5] *A case record is a sub-folder within an agency case file that results in a Laboratory Report. There may be multiple case records (Laboratory Reports) in a criminal case. For example, a homicide case submitted may result in a firearms report, a latent evidence report, and a DNA report.*

2. Case Completions

For FY 2022-2023, scientists in the SCL system worked 46,582 case records, broken down as follows:

- The full-service **Crime Laboratory in Raleigh** worked 22,088 case records, as well as 1382 CODIS hits to the DNA Database
- The **Triad Regional Crime Laboratory** worked 5,905 case records.
- The **Western Regional Crime Laboratory** worked 18,591 case records.



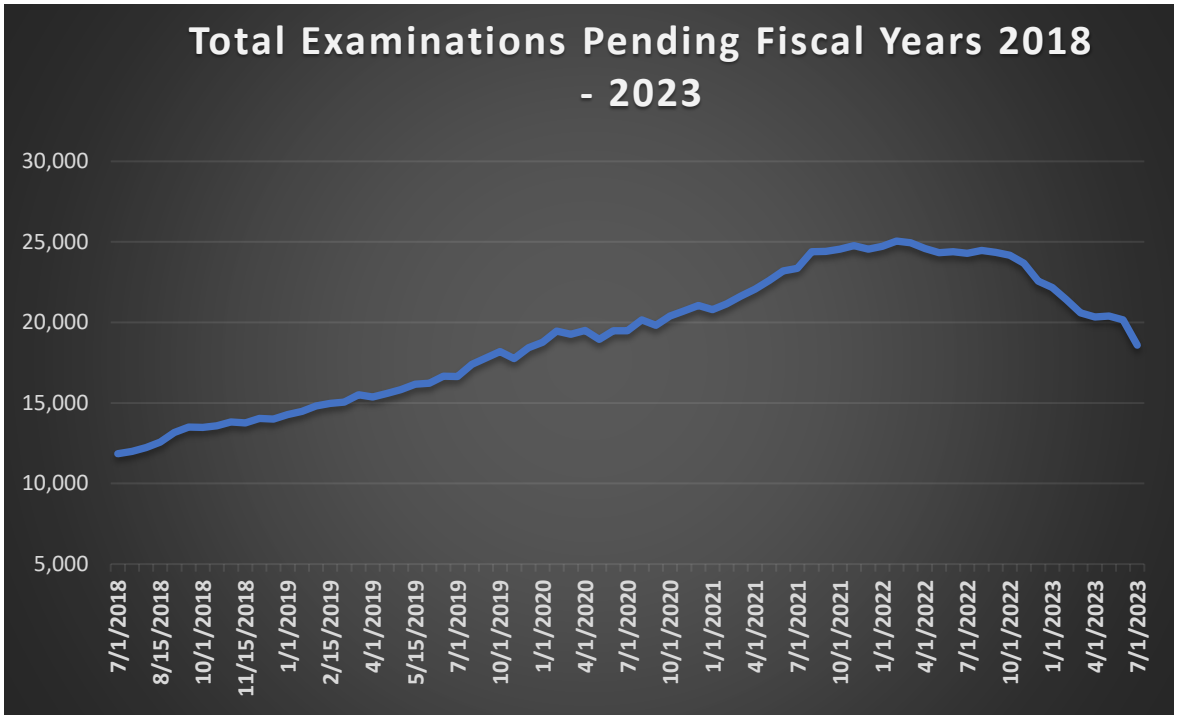
Note: The Stop work program went into effect starting FY 18-19. This chart above breaks down the completed case record examinations and the stop worked case records terminated by the customer.

In FY 2022-2023, the SCL completed the following cases, broken down by discipline and laboratory location:

	Raleigh	Triad	Western	TOTALS
Drug Chemistry	9,825	3,989	10,977	**24,791**
Toxicology	5,224	1,765	3,687	**10,676**
Forensic Biology	3,890	5	2,527	**6,422**
Firearms	1,627	2	817	**2,446**
Latent Evidence	298	143	213	**654**
Trace Evidence	987	1	370	**1,358**
Digital Evidence	235	0	0	**235**
TOTALS	**22,086**	**5,905**	**18,591**	**46,582**

3. Pending Caseload over a five-year period

A five-year study of the Laboratory's pending caseload shows an increase of exams waiting for analysis overall. There are two major factors responsible for this increase: the increase in submissions, and the complexity of the cases, specifically in the disciplines of toxicology and drug chemistry. At the onset of 2022, the Laboratory was able to complete more cases than submitted, decreasing the backlog of pending examinations.



a. Lead Times[6]

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) calculated for the last reportable quarter of the fiscal year is 276 days. Lead times for individual cases vary depending on the amount of evidence submitted and the types of analysis requested. The average turnaround time to complete a laboratory exam from start to finish is 60 days.

b. Rush Case Program

The SCL continues to operate a successful rush case program to give Law Enforcement Agency Heads or prosecutors the option to expedite cases when appropriate. Upon the request of a Law Enforcement Agency Head or prosecutor 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

[6] ***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.*

management welcomes inquiries from Law Enforcement Agency Heads or prosecutors about cases when a rush request may be needed.

c. Court Testimony and Judicial Efficiencies

In FY 2022-2023, Laboratory scientists spent a total of 3,509 hours attending court. Of those hours, they spent 2,180 hours traveling to court, 883 hours waiting to testify, and 445 hours testifying. Assistance is still needed from our criminal justice stakeholders to minimize the time forensic scientists spend in court and away from the laboratory. Only 13% (445 hours of the 3,509 hours) of the time an analyst spent outside the laboratory for court purposes was spent testifying.

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. The SCL appreciates the updates to the General Statutes in the biennium budget making district court remote testimony more easily available to our scientists. Subject matter experts from the SCL are current members of the Remote Testimony Task Force committee and subcommittees appointed by Chief Justice Paul Newby and are representative of stakeholder groups from the court system.

The passage of N.C. G.S. 15A-1225.3 now allows a scientist to testify remotely if appropriate notice if provide to the defendant. The Laboratory has received 938 virtual subpoenas from a total of 41 counties. **In FY 22-23, we appeared virtually 43 times and testified 24 times across 10 different counties.** As of October 2, 2023, scientists have appeared virtually 69 times in 16 counties, providing testimony in of these appearances (54%). The laboratory has saved 245 hours of travel time to court which equates to 13,458 miles not driven.

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

In June 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 16,219.

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, SESSION LAW 2018-70.

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

During the interim, before the 2019 session of the General Assembly, DOJ spearheaded an initiative to test 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 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 passed and became law in September of 2019.

The Survivor Act appropriated $6M of general funds to aid to test remaining SAECKS and created 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.

Law enforcement is now required to submit both previously untested SAECKs and SAECKs from current sexual assault cases. Necessarily, the Survivor Act has dramatically increased the workload for both the Evidence Control Unit, the Forensic Biology Section and the Trace Evidence Section. The Evidence Control Unit accepts submissions of the SAECKs from law enforcement for current sexual assault cases they are investigating. These SAECKs from current cases are then forwarded to the Forensic Biology Section for analysis. In addition, our Forensic Biology Section has an increased workload, as it prepares SAECKs for the vendor lab to analyze. 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; approving the case for shipping to a vendor laboratory; and coordination with the vendor laboratory on shipping/receiving of kits from all law enforcement agencies. The vendor laboratory processes the cases and reports the results directly to the law enforcement agencies as well as the SCL. The SCL also reviews qualifying data from the vendor laboratories for upload into CODIS. The Trace Evidence Section screens evidence in Sexual Assault Kits for potential hair roots when DNA testing is inconclusive or not identified on the swabbings. Forty percent of Sexual Assault Kits require Trace Evidence examination.

Additionally, the SCL had an outsourcing contract with a vendor laboratory that ended on June 30, 2020. Due to the nationwide demand for SAECK testing as well as the inclusion of courtroom testimony fees, the cost per kit in the new contract increased from $695 per kit to $1,245 per kit, a 79% increase.

The SCL established a new outsourcing contract with a vendor laboratory from 2023-2026 with the cost per kit being $ 1341 per kit with an additional cost being $450 per kit if analyzed using mixture interpretation software (specifically STRmix® software), a requirement of DNA casework at the SCL.

With the increased cost per kit and the return of the VOCA grant funds, an additional $9M was requested to test the backlog of previously untested SAECKs located throughout the state. The SCL is very appreciative of the appropriation of those funds in the biennium budget.

Testing these old kits is solving crimes. As of the writing of this report, analysis has been completed on 11,775 kits. All reviews are estimated to be completed by early 2024. These completed tests have led to numerous arrests in longstanding cold cases – as approximately 50% 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.

Over $10M of the Survivor Act funding is encumbered as of the writing of this report. Working in partnership with the District Attorneys, the SCL intends to use the remaining $4.5M to outsource current sexual assault kits for more timely turn-around.

Here are some examples of the impact we are seeing of testing these kits:

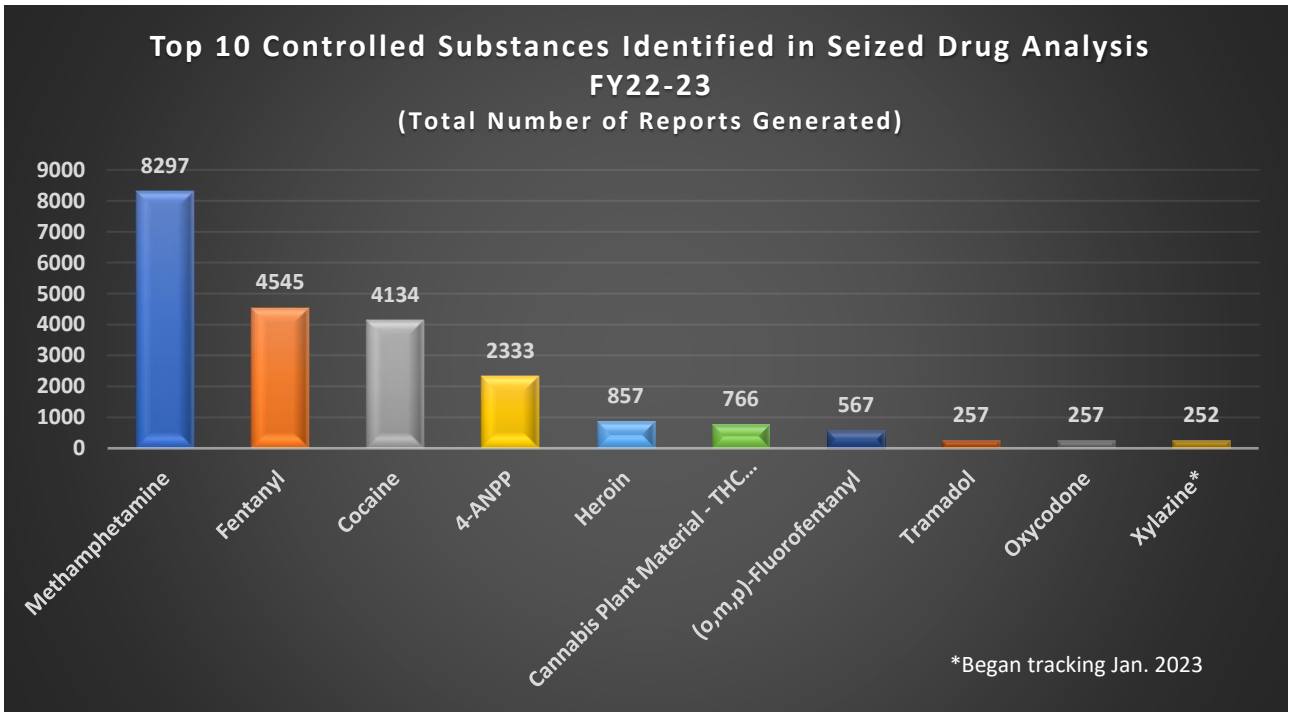
- The Raleigh Police Department arrested a man alleged to be responsible for a 1995 sexual assault cold cases and several other cases, charging him with 15 counts of sexual assault, 12 counts of rape, 10 counts of kidnapping, and other charges.
- A Raleigh man was arrested in March for the rape of a 73-year-old-woman he allegedly committed in 1990.
- A Fayetteville man pleaded guilty to a 1992 sexual assault and was sentenced to 40 years in jail. The

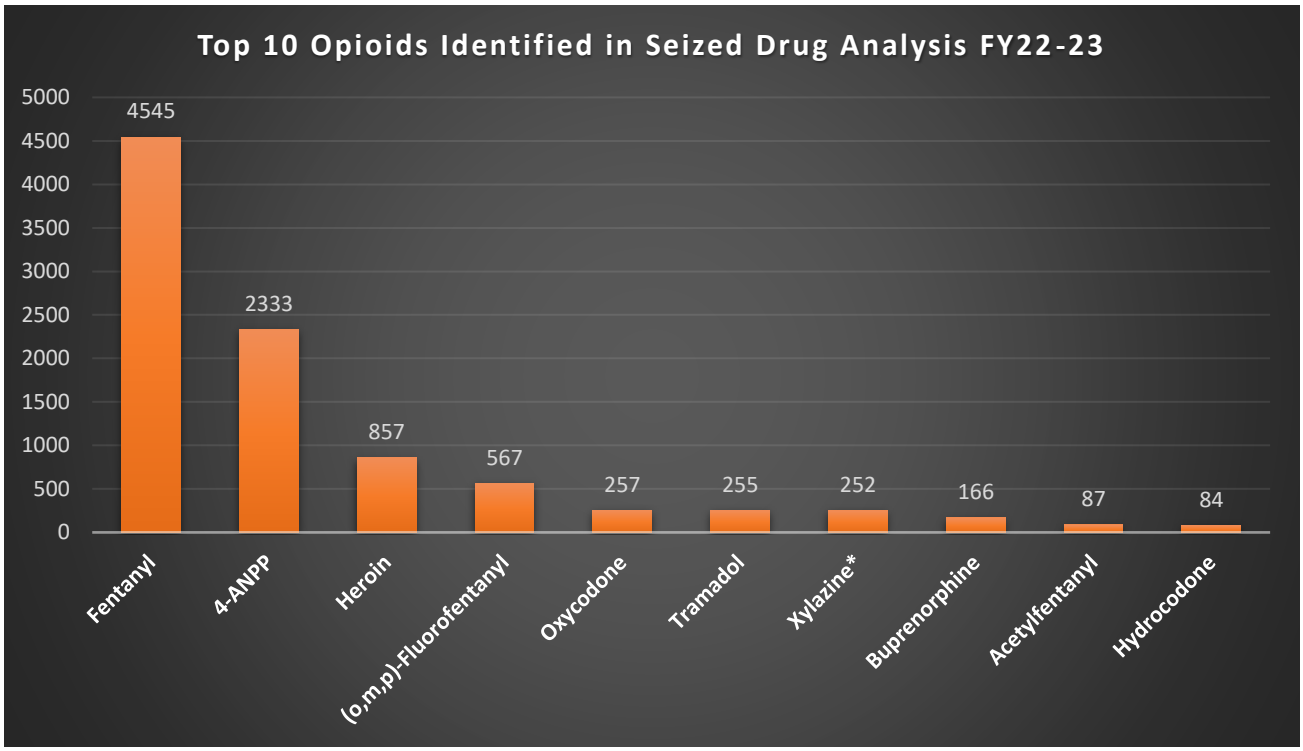
Fayetteville Police Department resubmitted the sexual assault kit for testing in 2006, leading to the suspect's arrest in 2020.
• A New Hanover County jury convicted a Wilmington man on first degree kidnapping, two counts of first-degree rape, two counts of first-degree sexual offense, and robbery, carrying a prison sentence of 36 and 44 years.

e. Statistics and Trends in Drug Chemistry and Toxicology

The Crime Laboratory collects various data which are reported to the Federal Government for statistical purposes, trend monitoring, and policy making.

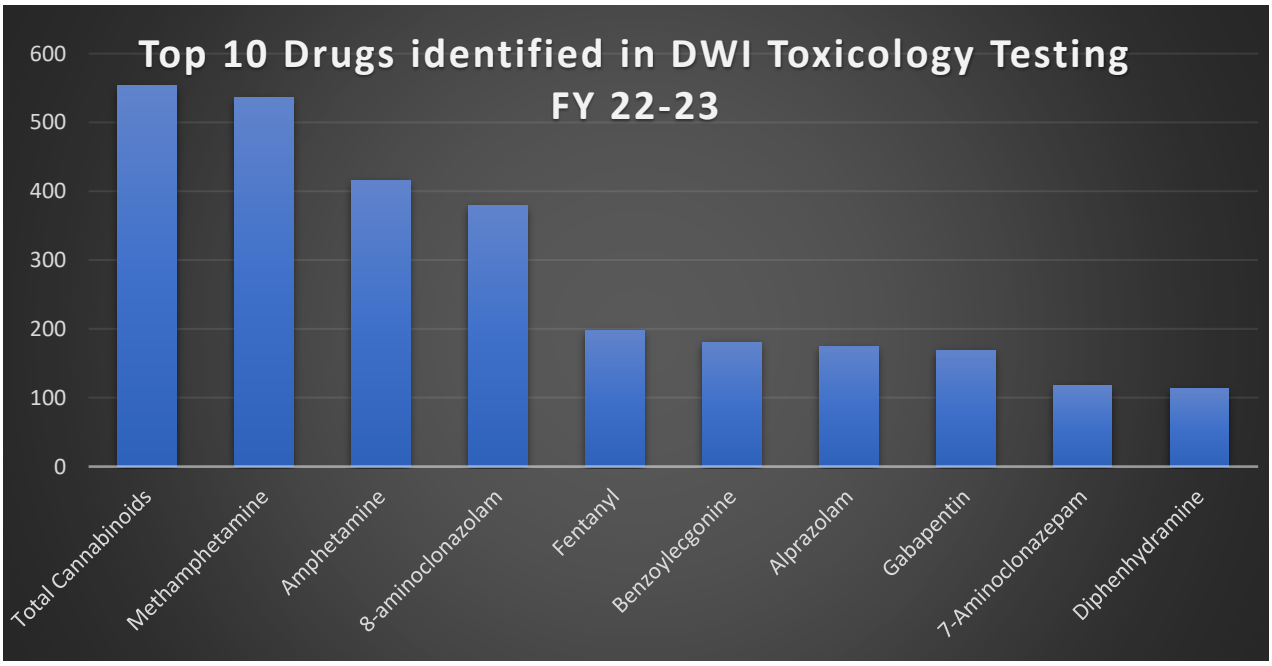
The Drug Chemistry Section continued to see an increase in the complexity of cases submitted. Analysis of these items involves counting and verifying the number of units present, and documenting and analyzing multiple units to meet statutory weight thresholds. Often there is more than one controlled substance present in these samples or varying concentrations of these substances, which requires repeat and/or additional analysis and takes longer for scientists to analyze. Additionally, there has been an increase in the number of clandestine pharmaceutical and non-pharmaceutical tablets. During FY22-23 the drug chemistry section of the North Carolina State Crime Laboratory (NCSCL) received 20,830 case records for analysis between July 1, 2022, and June 30, 2023, and in that time completed 18,642 case records. Methamphetamine was the most reported controlled substance at approximately 44.5% of overall case record identifications followed by fentanyl at 24.4%, cocaine at 22.2%, 4-ANPP (a fentanyl precursor chemical) at 12.5% and heroin at 4.6%. In January 2023, the NCSCL began tracking cases containing the non-controlled substance xylazine for potential consideration of future scheduling in the NC Controlled Substances Act. Since then, a total of 252 case records contained xylazine. The top ten reported controlled substances can be found in the below chart, as well as the top 10 Opioids Identified in FY 22-23. **The SCL continues to see a rise in other opioid classes, such as nitazenes and xylazine.**



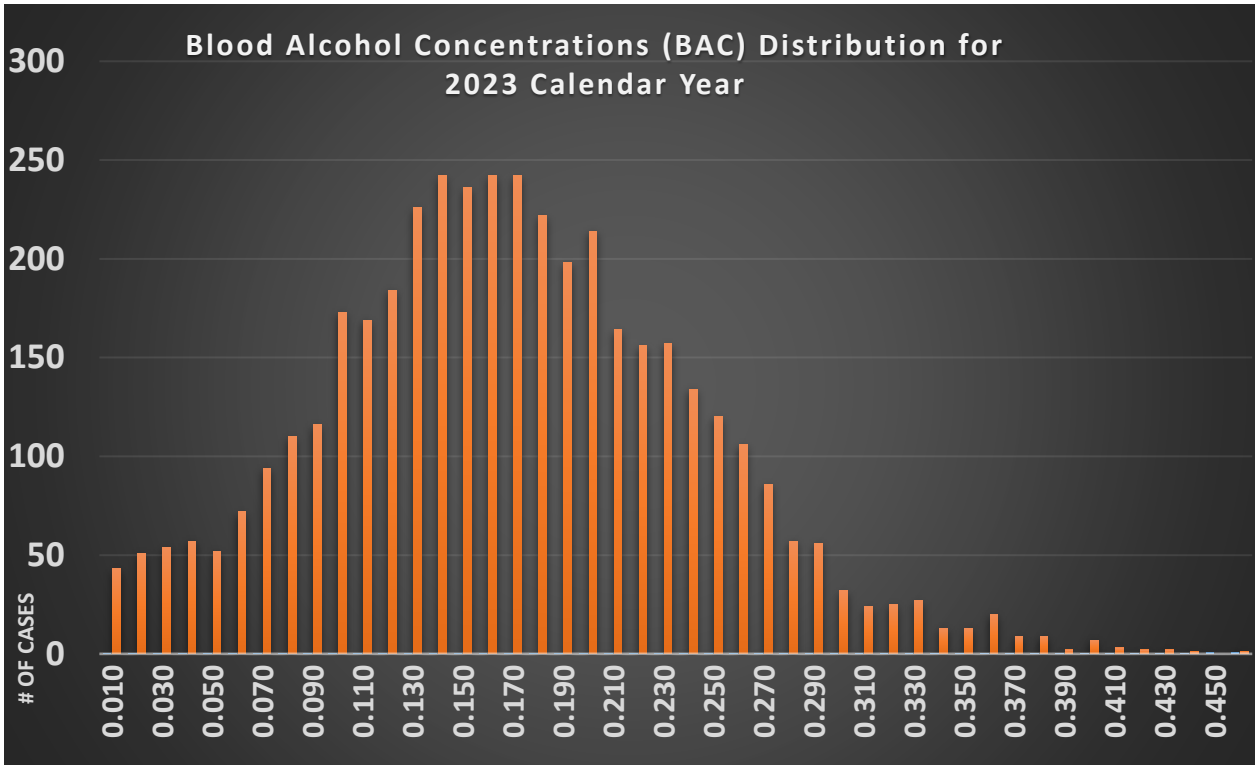


Xylazine is not a controlled substance at the time of this report.

In FY 2022-2023 the **Toxicology Section** of the SCL tested 3,300 DWI related blood samples for drugs. There was an average of 2.5 different drugs identified in the positive samples. The most prevalent drugs identified continued to be cannabinoids (THC and metabolites; marijuana) followed by Methamphetamine and/or Amphetamine. However, the designer benzodiazepines metabolite 8-aminoclonazepam was identified twice as often as alprazolam. During this FY, the prevalence of fentanyl in DUID cases increased 150% compared to last year. Gabapentin prevalence increased approximately 125% compared to the previous fiscal year.



Below is the chart of distribution of Blood Alcohol Concentrations analyzed in calendar year 2022. The average BAC in DWI cases is 0.17. The average BAC has remained between 0.15-0.17 for the last several years.



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 nearly **all forty-three District Attorneys are participating**. As a result, the SCL can focus on the cases where forensic analysis is still needed. Stopping work on 8,056 case records for FY 22-23 equals a savings of $ 3.6M in unnecessary testing.

V. Human Capital

In FY 2022-2023 there were 11 hires, 30 internal promotions, 12 resignations, 5 retirements, and 1 transfer. The SCL had a vacancy rate of 20.2% 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, depending on the scientific discipline. During training, a forensic scientist cannot test items of evidence submitted in criminal cases and therefore cannot contribute to overall casework or case reduction during this time.

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. We are respectfully requesting a recurring salary adjustment fund appropriated to address recruitment and retention

needs for the Forensic Scientist series, including salary increases and promotional opportunities. The chart below depicts the hiring and losses specifically of scientists, for the last six fiscal years:

Fiscal Year	Number of Scientists Hired	Number of Scientists Who Have Resigned	~Discipline Departed From	Human Capital Financial Loss	~Tenure of Scientists who Resigned
FY 17-18	5	**4	Drug Chemistry (2); Toxicology (1); Latent (1)	$400,000	7 months, 1.5 years, 5.2 years, 5.3 years
FY 18-19	12	4	Firearms (1); Trace (1); Toxicology (1); Latent (1)	$400,000	4 months, 6 months, 1.5 years, 2.5 years
FY 19-20	*8	2	Drug Chemistry (2)	$200,000	1.1 years, 3.4 years
FY 20-21	*16	**5	Forensic Biology (3); Firearms (2);	$500,000	1.5 years, 1.4 years, 1.5 years, 2.8 years, 2.8 years
FY 21-22	16	**3	Forensic Biology (1); Firerarms (1); Drug Chemistry (1)	$300,000	1.4 years, 1.8 years, 1.9 years
FY 22-23	11	1	Firearms (1)	$100,000	6 months
Totals	**68**	**20**		**$1,900,000**	**Avg tenure: 1 year 11 months**

* *Number corrected since last report*

** *Resignations updated since last report*

~ *The order in the "discipline departed" column correlates to the order of the "tenure of scientists who resigned" column*

^^ *Attrition Rate of Scientists Hired in Last Six FY: 29.41% (20 resignations/68 hires)*

Note 1: Attrition Rate of Scientists Hired in Last Six FY: 29.41% (20 resignations/68 hires). Over the previous six fiscal years, 68 scientists were hired and 20 of them have since resigned – a 29.4% attrition rate*. These scientists had an average tenure of approximately 1 year 11 months. The $1.9M of the state's investment had very little return since the training period is between 1 to 2 years.

Note 2: Of importance, each time a scientist resigns, the Laboratory spends approximately $100,000 to train a new employee to fill the vacated position. There is no return on investment during this period as the scientist is not permitted to work criminal evidence until completing a rigorous training program. (Each scientist must complete modules of training which include written and oral examinations, practical exercises, a competency test(s), and a mock trial before training is considered complete.). In FY 2022-2023 the NCSCL trained approximately 30 scientists. This equates to $3.0M of salary funds to pay employees who are not yet contributing to the pending caseload. This figure does not include the monetary loss of time set aside by other trained scientists to train the new hires. A recurring salary adjustment fund would help retain employees who have historically left for higher paying salaries and will give the Laboratory a larger return on investment.

VI. Fiscal Resources[7]

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. Nine of the thirteen investigative areas noted were lower in cost per case compared to the FORESIGHT Median cost per case. 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.

Cost per Case by Investigative Area

Area of Investigation	North Carolina	25th percentile	Median	75th percentile
Digital evidence *	$2,457	$1,536	$2,714	$5,301
DNA Casework *	$1,376	$1,154	$1,482	$2,333
DNA Database	$211	$47	$79	$134
Drugs - Controlled Substances *	$255	$288	$407	$502
Fingerprints	$1,785	$790	$1,077	$1,460
Fire analysis *	$963	$1,972	$3,064	$5,013
Firearms and Ballistics	$2,451	$1,423	$2,405	$3,549
Gun Shot Residue (GSR) *	$562	$2,309	$3,424	$4,764
Footwear and Tiretrack Impressions *	$6,600	$5,804	$6,902	$9,523
Serology/Biology *	$358	$840	$1,172	$1,946
Toxicology - Blood Alcohol Analysis *	$74	$126	$220	$336
Toxicology - Blood Drug Analysis	$939	$589	$798	$997
Trace Evidence *	$3,303	$4,364	$5,782	$9,820

Below median cost

As newly hired scientists completed their training and began work on active criminal cases and as submissions have increased for the last six years, the SCL's supply costs have also increased. During FY 2022-2023, the SCL expended more than $2.5M on scientific supplies of which 76% was DNA-related. Specifically, $1,863,931 was expended on DNA, while $595,515 was expended on non-DNA disciplines. Of that amount, 28% or $686,044 (compared to 18% or $454,941 in FY 2021-2022) was from General Fund Appropriations and the remaining 87% or $1,773,402 (compared to 82% or $2,041,816 from FY 2021-2022) was from grant funding.

During FY 2022-2023, the SCL had active funding from various federal grants ranging from approximately $6.2M to $7.5M. Funding was utilized to replace scientific instruments, purchase supplies, and to pay for training for SCL staff to meet mandated certification and accreditation requirements.

[7] *S.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 2020-2021 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.*

The SCL system has approximately $15M in instrumentation throughout all three labs as reflected below:

Raleigh Lab Instrument Total	**$ 9,246,695.69**
Triad Lab Instrument Total	**$ 2,016,000.00**
Western Lab Instrument Total	**$ 3,583,893.14**

Instrument cost varies within the laboratory system from a $75,000 comparison microscope used in the comparison of Firearms evidence, to a $185,000 Genetic Analyzer used to separate and analyze DNA in homicides and sexual assault analysis in Forensic Biology, to a $355,000 Quadrupole Time of Flight Instrument used in DWI analysis in Toxicology.

VI. 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. Drug Chemistry and Toxicology submissions continue to include complex opioids such as fentanyl and fentanyl-based analogs. These types of drugs require extensive and complicated testing that lengthen turnaround times. The SCL continues to monitor new and emerging compounds.

VII. Conclusion

The SCL has worked to continuously improve using Lean Six Sigma efficiency methodology. These improvements include 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.

Given this competitive job market, we need the ability to retain scientists and remain competitive in salary offers to recruit more scientists. We are respectfully requesting a recurring salary adjustment fund appropriated to address recruitment and retention needs for the Forensic Scientist classification series, including salary increases and promotional opportunities. A recurring salary adjustment fund will allow us to offer more competitive salaries thus filling current vacancies more quickly and facilitating retention of our forensic scientists so that we can meet the state's public safety needs.

The Survivor Act and the increasing demands of the opioid crisis have significantly increased submissions. Retention of trained scientists and an adequate funding resource for scientific instruments, 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 February 1, 2024,

Leslie Dismukes
Interim Director, North Carolina State Crime Laboratory

Appendix A - Submissions by County

	7/1/2019 to 6/30/2020		7/1/2020 to 6/30/2021		7/1/2021 to 6/30/2022		7/1/2022 to 6/30/2023	
County	Submissions	Items Submitted	Submissions	Items Submitted	Submissions	Items Submitted	Submissions	Items Submitted
Alamance	458	744	572	955	507	719	479	710
Alexander	101	140	103	195	130	187	149	238
Alleghany	52	61	38	57	48	70	82	98
Anson	85	178	107	467	71	254	62	136
Ashe	117	142	165	187	192	268	138	160
Avery	83	139	56	85	106	134	82	113
Beaufort	346	502	309	442	350	470	360	453
Bertie	39	60	45	74	31	34	37	86
Bladen	109	158	88	196	45	66	59	93
Brunswick	727	1014	643	895	861	1215	831	1131
Buncombe	1460	2407	1377	2325	1477	2408	1675	2542
Burke	415	612	548	765	411	533	420	518
Cabarrus	786	1023	864	1255	838	1270	900	1362
Caldwell	381	526	411	559	485	638	411	545
Camden	16	32	26	51	33	57	52	86
Carteret	406	570	309	474	295	472	360	599
Caswell	99	126	78	106	43	80	63	92
Catawba	715	941	920	1274	852	1279	734	935
Chatham	135	189	157	246	155	261	119	220
Cherokee	140	280	216	345	315	488	276	411
Chowan	31	46	82	141	48	87	30	75
Clay	64	139	86	121	89	141	59	96
Cleveland	564	941	718	1145	634	808	714	1553
Columbus	136	216	241	369	303	508	273	428
Craven	454	788	821	1273	668	974	667	1026
Cumberland	1161	1911	954	1579	998	1651	960	1594
Currituck	80	105	86	134	92	120	78	93

	7/1/2019 to 6/30/2020		7/1/2020 to 6/30/2021		7/1/2021 to 6/30/2022		7/1/2022 to 6/30/2023	
County	**Submissions**	**Items Submitted**	**Submissions**	**Items Submitted**	**Submissions**	**Items Submitted**	**Submissions**	**Items Submitted**
Dare	212	280	260	388	269	407	256	351
Davidson	510	661	742	929	630	819	632	857
Davie	125	171	112	173	94	161	129	220
Duplin	373	560	314	418	407	580	347	461
Durham	709	993	747	1113	757	1034	1215	1163
Edgecombe	364	507	379	591	372	545	362	652
Forsyth	834	1744	557	1058	516	791	883	999
Franklin	521	764	399	615	422	622	290	455
Gaston	1116	1496	1458	2042	1593	2698	1805	2834
Gates	23	33	26	35	15	18	11	15
Graham	67	102	78	129	98	176	59	87
Granville	279	710	208	376	252	400	155	234
Greene	60	124	88	217	45	64	52	90
Guilford	2002	2998	1768	2813	1723	2527	1389	1993
Halifax	273	439	294	477	287	490	288	429
Harnett	280	506	428	606	379	627	297	426
Haywood	528	769	591	937	528	804	665	1038
Henderson	524	770	634	933	781	1111	740	1030
Hertford	78	120	132	383	91	211	132	605
Hoke	305	736	345	761	336	694	271	746
Hyde	2	2	5	4	11	18	1	1
Iredell	397	622	493	750	531	848	494	720
Jackson	337	554	294	536	298	455	340	484
Johnston	710	922	655	959	650	913	578	834
Jones	85	112	42	57	39	58	44	75
Lee	230	333	154	226	206	443	333	528
Lenoir	445	643	363	777	373	681	520	1109
County	**7/1/2019 to 6/30/2020**		**7/1/2020 to 6/30/2021**		**7/1/2021 to 6/30/2022**		**7/1/2022 to 6/30/2023**	

	Submissions	Items Submitted	Submissions	Items Submitted	Submissions	Items Submitted	Submissions	Items Submitted
Lenoir	445	643	363	777	373	681	520	1109
Lincoln	378	530	487	676	505	660	597	834
Macon	240	315	365	515	258	384	227	336
Madison	101	155	161	230	121	191	95	112
Martin	88	123	143	202	307	509	216	509
McDowell	267	455	250	472	295	460	282	450
Mecklenburg	416	606	445	674	415	541	454	632
Mitchell	34	70	81	126	98	138	56	67
Montgomery	77	133	89	151	89	152	132	250
Moore	476	619	531	799	594	910	568	895
Nash	629	808	591	746	578	717	445	555
New Hanover	1502	3051	1267	2587	933	1887	533	977
Northampton	61	172	81	200	55	134	48	84
Onslow	926	1556	1060	1632	952	1486	772	1106
Orange	382	581	511	790	367	523	401	641
Pamlico	130	228	99	192	90	130	126	172
Pasquotank	239	407	211	332	224	350	169	389
Pender	181	327	203	356	130	251	141	251
Perquimans	46	63	66	150	97	145	55	84
Person	128	220	150	247	184	307	225	592
Pitt	408	591	451	796	473	740	384	709
Polk	121	175	165	223	193	252	142	189
Randolph	834	1118	901	1257	903	1296	819	1137
Richmond	308	581	293	597	320	631	485	705
Robeson	543	1725	446	1420	439	969	506	931
Rockingham	450	594	438	664	540	747	500	680
Rowan	713	1092	857	1310	573	815	778	1702

	7/1/2019 to 6/30/2020		7/1/2020 to 6/30/2021		7/1/2021 to 6/30/2022		7/1/2022 to 6/30/2023	
County	Submissions	Items Submitted	Submissions	Items Submitted	Submissions	Items Submitted	Submissions	Items Submitted
Rutherford	319	454	360	492	296	393	607	850
Sampson	452	729	549	1160	493	801	427	967
Scotland	252	523	229	424	195	370	195	341
Stanly	461	580	574	774	390	538	400	488
Stokes	169	233	164	227	168	205	139	175
Surry	508	680	494	679	469	635	331	504
Swain	119	159	83	123	123	144	119	162
Transylvania	108	150	121	193	137	208	130	182
Tyrrell	15	22	33	38	31	49	29	38
Union	632	843	746	1008	652	844	664	838
Vance	339	591	358	587	215	461	291	469
Wake	494	1117	392	867	482	669	733	920
Warren	35	64	49	84	47	74	40	62
Washington	16	36	99	137	94	110	32	43
Watauga	174	231	176	219	226	330	270	349
Wayne	864	1323	1060	1929	880	1644	884	1575
Wilkes	278	359	303	365	287	408	331	448
Wilson	746	1066	760	1203	764	1305	685	1176
Yadkin	189	234	208	319	182	239	182	288
Yancey	86	129	93	146	107	165	88	144
TOTAL	**36483**	**57479**	**38779**	**62336**	**37751**	**58304**	**38091**	**58837**

Appendix B (Page 21)
Note: This document was provided to the General Assembly in March 2023

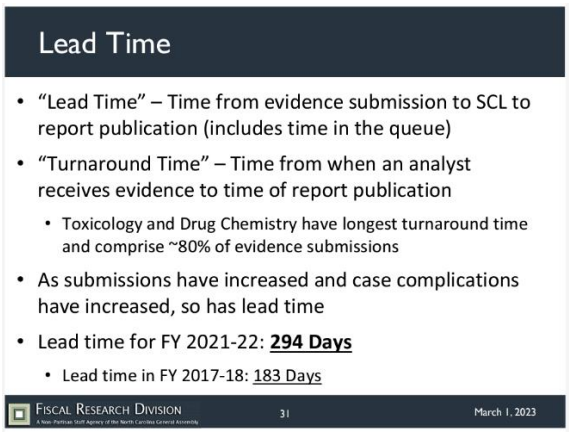
A Proposal to Improve Recruitment & Retention of State Crime Lab Scientists In Order to Process Evidence More Quickly & Better Protect Public Safety

Responding to a request from a General Assembly member, the State Crime Lab developed this expanded proposal to improve recruitment and retention of forensic scientists at the Lab. If funded, this proposal would improve recruitment and retention of scientists, help the Lab process evidence more quickly, better serve the needs of law enforcement and prosecutors, and – in these ways – better protect public safety. While it would cost $4 million (recurring) in the coming biennium to fully fund this proposal for retention of forensic scientists, and support for non-scientists at the Crime Lab is also needed, our current request is for $2.5 million (recurring) to begin to implement the proposal.

OUR CHALLENGE

Fiscal Research recently reported to the Joint Appropriations Committee on Justice and Public Safety that the average lead time from submission of evidence to the State Crime Lab to report publication back to law enforcement has grown from 183 days in FY 2017-18 to 294 days in FY 2021-22. See FIGURE ONE.

FIGURE ONE:
LEAD TIME AT THE STATE CRIME LAB



SOURCE: Fiscal Research presentation to Joint Appropriations Committee on Justice and Public Safety, March 1, 2023.

While many factors have contributed to the increase in lead time – including more total submissions and more complicated submissions to the lab – the key to turning the situation around is having more Crime Lab scientists working more cases in less time. To this end, the General Assembly took a major step forward in FY 2021-23 biennium when it appropriated nearly $1.3 million (recurring) to support an additional 12 Crime Lab scientists.

While this infusion of additional funding for scientists has the potential (coupled with improvements in efficiency at the Lab) to reduce the lead time, the impact of this investment is diminished if we cannot recruit and retain the scientists we need. And that is exactly the challenge we face today: Even as we work tirelessly to recruit forensic scientists, we are finding that individuals in Forensic Scientist I (FS-I) and Forensic Scientist II (FS-II) positions are leaving the Lab after roughly four years on the job.

FIGURE TWO illustrates the challenge. Out of the 60 forensic scientists hired over the past five fiscal years, 11 have already resigned. These 11 scientists had an average tenure of just 1.5 years. Because it takes one to two years to train a forensic scientist before they are allowed to work cases on their own, the State got little to no return on the more than $1 million invested in the 11 scientists that left. Considering the growth in evidence submissions and lead times in recent years, the State can ill afford to invest hundreds of thousands or millions of dollars in scientists who leave the Crime Lab before making any meaningful dent in the backlog of evidence submissions. We can and must do better.

FIGURE TWO:
CRIME LAB HIRES OVER PAST FIVE YEARS

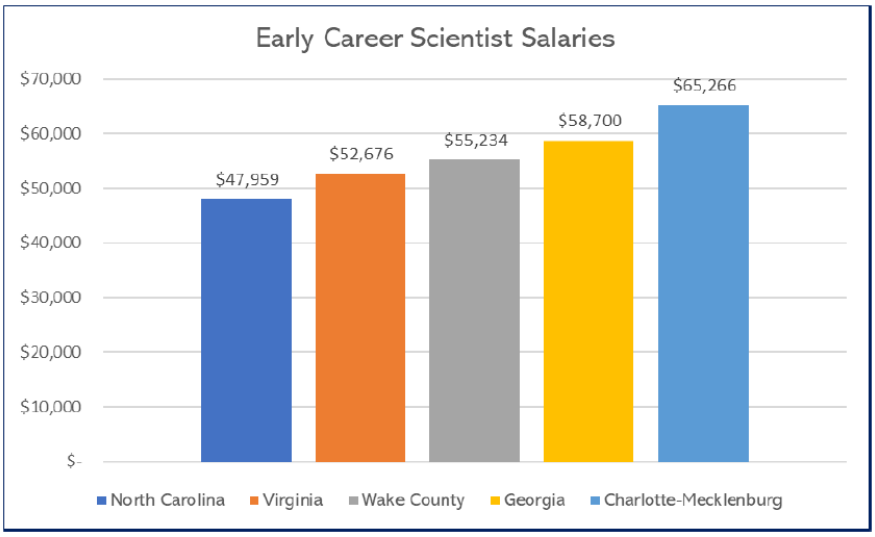
Fiscal Year	Number of Scientists Hired	Number of Those Scientists Who Have Since Resigned	Human Capital/ Financial Loss	Tenure of Scientists who Resigned
FY 17-18	5	3	$300,000	7 months, 1.5 years, 5.2 years
FY 18-19	12	4	$400,000	4 months, 6 months, 1.5 years, 2.5 years
FY 19-20	14	2	$200,000	1 year, 1.5 years
FY 20-21	13	2	$200,000	1.5 years, 1.6 years
FY 21-22	16	0	0	
Totals	**60**	**11**	**$1,100,000**	**Avg tenure: 1 year 7 months**

SOURCE: NC State Crime Lab

To better recruit and retain forensic scientists at the Crime Lab, we need to address the two main reasons that scientists tell us they leave the Lab: **(1) <u>low pay</u>** and **(2) <u>limited opportunities for advancement</u>.**

(1) <u>Low pay</u>. Starting salaries at the State Crime Lab are as much as $10,000 lower than those available to forensic scientists in surrounding state and local crime labs. See FIGURE THREE. It should come as no surprise, therefore, that over 40 percent of scientists who are offered a position at the State Crime Lab turn down the salary offer, and (as noted above) many scientists who do come to the Lab end up leaving after only a few years on the job.

FIGURE THREE:
EARLY CAREER SCIENTIST SALARIES



TECHNICAL NOTES: The Georgia starting salary averages the starting salaries for a Crime Lab Scientist Trainee and a Crime Lab Scientist I. The Wake County City Bureau of Investigation (CCBI) starting salary averages the starting salary for all entry discipline positions. The CMPD hires new employees at 85 to 90 percent of the midpoint salary based on E&E; this is average of that value for the different discipline positions.

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(2) <u>Limited opportunities for advancement</u>. Candidates we are seeking to recruit to the State Crime Lab often inquire about their potential career progression; and we must tell them that there is no defined path for advancement at the Lab. By contrast, surrounding state laboratories have some form of a salary schedule for their forensic scientists, offering scientists a concrete understanding of their potential for advancement.

The current challenge is that the breakdown of scientist positions includes a large number of Forensic Scientist I and II positions throughout each of the disciplines, meaning there are fewer mid- and high-level positions at the Lab and thus fewer promotion opportunities. When individuals near the four-year mark working as a Forensic Scientist I or II, they seek opportunities for career growth – and all too often we are unable to meet these needs.

This challenge is not limited to forensic scientists early in their careers. More experienced scientists who have demonstrated their commitment, effectiveness, and loyalty to the State over a period of years also seek opportunities for career growth. Today, the only opportunity above a Forensic Scientist III position is in management. But the number of management positions is limited, and not every senior scientist with a high level of talent and motivation has the particular desire or set of skills to become a manager. Just as we need to offer early career scientists opportunities to advance, we must also offer these more senior forensic scientists a path forward in order to retain highly qualified scientists at all levels.

OUR PROPOSAL

To address these challenges, help the Crime Lab process evidence more quickly, and better protect public safety, we respectfully propose that the General Assembly appropriate $2.5 million (recurring) for a **salary reserve fund** to attract and retain forensic scientists at the lab.[1] To maximize the impact of these funds, the State Crime Lab and Department of Justice would work with the Office of State Human Resources to create an **experience-based salary schedule**.

FIGURE FOUR offers an example of how this might work in practice at the Crime Lab. Under this example, a forensic scientist that meets or exceeds casework goals and other job-related expectations would expect to receive 2.5 percent increase in salary for the first four years, a 5 percent increase for the next three years, and a 10 percent increase for year 8. A promotion from Forensic Scientist I to Forensic Scientist II (or from FS-II to FS-III, or from FS-III to FS-IV) would occur after four years of service in the lower grade, provided that the candidate for promotion meets or exceeds NCVIP and casework goals, meets or exceeds expectations with respect to collateral duties, and is not under disciplinary action.

In addition, FIGURE FIVE offers an example of performance expectations required for promotion, and FIGURE SIX offers an example of the collateral duties that may be required for advancement under an experience -based salary schedule.

Creation of a Forensic Scientist IV classification – in addition to the FS-I, FS-II, and FS-III classifications that exist today – is an essential component of this proposal. Creation of an FS-IV classification will help retain highly qualified senior scientists who wish to advance in their careers and contributions to the State – but who may not have the desire or skill set to step into a management role at the Lab. To retain these talented and motivated senior scientists, we propose to create a dual career ladder, allowing them to seek promotion to a management position or (alternatively) to a position as a senior individual contributor or technical leader (Forensic Scientist IV).[2]

[1] While it would cost $4 million (recurring) in the coming biennium to fully fund our proposal for retention of forensic scientists, and support for non-scientists at the Crime Lab is also needed, our current request is for $2.5 million (recurring) to begin to implement the proposal, as noted at the outset.

[2] Such a change to the career ladder would require that DOJ work in partnership with OSHR and the State Human Resources Commission for approval of the new Forensic Scientist IV classification.

FIGURE FOUR:
EXAMPLE OF EXPERIENCE-BASED SALARY SCHEDULE AND
NEW MINIMUM SALARY POINTS AT HIRE OR PROMOTION

	At Hire / Promotion	Year 1	Year 2	Year 3
FS-I - hire at 1st quartile, 2.5% annual	$56,951	$58,375	$59,834	$61,330
FS-II - 2.5% promotion to 1st quartile / 5% annual	$62,789	$65,928	$69,225	$72,686
FS-III - 10% promotion to midpoint	$80,155			
FS-IV / FSS	$88,371			

TECHNICAL NOTES: Schedule offered as draft for discussion purposes, not as final or complete schedule. Senior level management salaries would be forecast for adjustment to minimize salary compression and ensure appropriate equity. A final schedule would require further discussions with the Office of State Human Resources (OSHR), Office of State Comptroller, and others – and it would need to include sufficient flexibility to ensure compliance with the existing OSHR pay structure and to address other requirements and contingencies.

FIGURE FIVE:
EXAMPLE OF PERFORMANCE EXPECTATIONS REQUIRED FOR PROMOTION

	Time in Grade	**Percentage of Time**	**Performance Expectations Met**
Forensic Scientist I	Year 1	100%	Training
	Year 2	100%	Training (if required & not completed in year 1)
	Years 3 &4	*80%*	*Casework and Report Writing*
	Years 3 &4	*10%*	*Court Testimony and Communication*
	Years 3 &4	*5%*	*Case File Review*
	Years 3 &4	*5%*	*Collateral Duties*
Forensic Scientist II	*4 Years*	*70%*	*Casework and Report Writing*
		10%	*Court Testimony and Communication*
		10%	*Case File Review*
		10%	*Collateral Duties*
Forensic Scientist III	4 years	*50%*	*Casework and Report Writing*
		25%	*Collateral Duties*
		20%	*Case File Review*
		5%	*Court Testimony and Communication*

FIGURE SIX:
EXAMPLE OF COLLATERAL DUTIES REQUIRED FOR ADVANCEMENT
UNDER A PERFORMANCE-BASED SALARY SCHEDULE

Collateral Duties for FSII, FSIII and FSS Classifications Amongst All Disciplines:
Technical Leader (Associated IRA and application process)
Document Control Custodian
Safety and Chemical Hygiene Officer
Forensic Advantage Administrator
Training Officer
Training Coordinator
Instrument Operators/Coordinators
Auditor (QAS and otherwise)
Specific Sub-Discipline Testing (ex: Y-STR; State CODIS Administrator, Asst CODIS Admin, SAFIS Coordinator)
Research and Development Analyst/Coordinator
Case Manager/Lead Worker
Intern Coordinator
Production Coordinator
Lean Six Sigma Workflow Coordinator
Laboratory Supply Coordinator
Drugs Standard Coordinator/Chemical Coordinator
Balances Coordinator
Retention Committee Representative
Clan Lab Response

CONCLUSION

To addresses challenges our State is facing in recruitment and retention of forensic scientists, help the State Crime Lab process evidence in less time, and better protect public safety, we respectfully propose that the General Assembly appropriate $2.5 million (recurring) that the Lab would deploy in tandem with an experience-based salary schedule like the one described above. We look forward to your questions and thank you for your consideration.