District of Columbia

Department of Forensic Sciences

2015 Annual Report

Forensic Science Laboratory | Public Health Laboratory | Crime Scene Sciences

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Letter from the Director

The Department of Forensic Sciences (DFS) has had many changes in 2015. At the beginning of the year, operations were disrupted by assessments received from a major stakeholder and the organization responsible for accreditation. Newly elected Mayor, Muriel Bowser, took decisive action directing the independent review of the issues by an external accreditation entity. Subsequently, after the report was issued, the separation of top management staff began at the end of April, 2015. As you read through this annual report, compiled by our staff, you will not find a story of failure but a roadmap to accomplishing a newly established vision that began May 1st under the direction of Interim Director, Roger Mitchell.

Already established as the Chief Medical Examiner for the District of Columbia, Dr. Mitchell quickly pulled the remaining staff together and engaged the DFS Internal Review and Report Team to determine the root cause of the failures identified and make recommendations for an appropriate way forward. I was very fortunate to have been invited to be a member of that team.

My first impressions of the Department was that the multi-million dollar, state-of-the-art laboratory was filled with mission-oriented individuals with exceptional talents and that the effort to bring the DNA laboratory out from under self-imposed suspension would not be short but was certainly achievable.

In July 2016, I was honored to be appointed as Interim Director by Mayor Bowser. I continued on the path established by Dr. Mitchell, and when I called my first official All Hands for the DFS staff, I spoke of my vision for DFS and outlined the following goals:

- *Be Independent but not Isolated from Critical Customers.*
- *Have Foresight with Insight formed by Hindsight concerning both Productivity and Quality.*
- *Deliver Exceptional Forensic Science to Inform Public Safety and Health Decision Making.*
- *Have Fiscally Responsible Leaders who Engage, Empower and Inspire using Best Management Practices.*
- *Provide Superior Training, Infrastructure, Tools and Resources to Ensure all Employees Successfully Accomplish the DFS Mission.*
- *Maintain a Diverse Workforce; Collegially Blending Youthful Enthusiasm with Experiential Wisdom.*

This annual report updates the progress that we have made towards attaining this vision.

No Director works alone and I am fortunate to have several talented professionals who guide me every day. Yi-Ru Chen, Brittany Graham and Karen Wiggins remained from the original management team. They took on additional management responsibilities in the early days of the transition and they continue today. Robert Hildum stepped in to assume the roles of General Counsel and he continues to provide excellent legal guidance for DFS. Dr. Kate Theisen, Quality Assurance expert, led efforts to enhance and strengthen the Department's Quality Culture. The image of the Department has been greatly improved by the tireless work of LaShon Beamon, our Director of Communications. The work

they provide directly impacts public safety and public health, yet they act anonymously, not seeking public attention. They experienced tremendous uncertainty this summer but this did not deter them from their critical mission. Their support and commitment have been steadfast and unwavering. Working with them, I believe our mission is within reach and attainable. The statute mandates it. The Mayor expects it, and our stakeholders and crime victims deserve it. My staff and I are here to ensure that the District's Department of Forensic Sciences provides world-class services to the citizens of the District of Columbia.

I AM DFS and WE ARE WASHINGTON DC

MISSION & ORGANIZATION

The District of Columbia's Department of Forensic Sciences (DFS) mission is to provide high-quality, timely, accurate, and reliable forensic science services with the use of best practices and best available technology; a focus on unbiased science and transparency; and the goal of enhancing public safety.

DFS provides independent analysis of evidence and samples submitted by agencies within the District of Columbia and its federal neighbors. Four organizational entities support the mission. The *Forensic Science Laboratory Division (FSL)* analyzes evidence submitted from criminal cases, including DNA, fingerprints, firearms, and digital evidence. The DFS also provides expert witness testimony in defense of their analytical reports in the District's courts of law. The *Public Health Laboratory Division (PHL)* provides diagnostic and analytical testing for biological pathogens and chemical agents from clinical, environmental, or food sources and provides emergency response testing as a Tier One laboratory within the national Laboratory Response Network. *The Crime Scene Sciences Division (CSS)* provides the collection, analysis, processing and preservation of evidence found at crime scenes in the District. The DFS *Agency Management & Operations Division* supports the work of the entire agency providing strategic direction, training, quality assurance, performance management, risk management, Discovery and legal guidance, human capital management, information technology support, data management, fleet and inventory management, procurement, and other administrative support services.

I AM DFS

The DFS staff includes individuals from various educational backgrounds and professional experience. More than just exceptional scientists are needed to power DFS. Our "I Am DFS" video was generated to reflect the diversity of the talented individuals required to cover the myriad of tasks and services within DFS and can be found on our YouTube channel: DC Department of Forensic Sciences .

	Agency Management & Operations	Forensic Science Lab	Public Health Lab	Crime Scene Sciences
Full-Time Employee Count*	30	42	17	38

*as of February 26, 2016

Stakeholder Raises Concerns: January 2015- April 30, 2015

In January of 2015, newly elected Mayor, Muriel Bowser, received a request from the United States Attorney's Office (USAO) that a panel of forensic DNA testing experts be allowed to meet with and interview members of the Forensic Biology Unit (FBU). The USAO had raised concerns to DFS management in the fall of 2014 about the approach used within FBU to interpret complex mixture profiles. In February, 2015 Mayor Bowser allowed DNA experts, Drs. Bruce Budowle and Fred Bieber, to interview FBU analysts. Additionally, she requested an external review of the FBU by The ANSI-ASQ National Accreditation Board (ANAB). ANAB was the organization that had accredited DFS in 2013 when the Department first opened.

On April 22, 2015 Dr. Bieber and Dr. Budowle issued *The Final Report on Review of Mixture Interpretation in Selected Casework of the DNA Section of the Forensic Science Laboratory (FSL) of the Department of Forensic Sciences (DFS*) to the USAO and the report was sent to Mayor Bowser. These experts made several recommendations concerning mixture interpretation within the FBU. The report cited:

- Inappropriate use of CPI/CPE in mixtures by inclusion of loci where allele drop out was highly probable

- Inappropriate use of the CPI/CPE in mixtures by including individuals whose known alleles were not present, at those loci, in the evidence samples
- Inappropriate calculation of two separate CPIs for the same forensic DNA mixture profile
- Not using established stochastic thresholds to assess potential allele drop out
- Inconsistencies and deficiencies in the technical review process of the DNA analysis pipeline

The ANAB Report provided to the Mayor on April 24, 2015 cited eight major and one minor nonconformity. They found:

"*The laboratory's DNA section is not in compliance with the FBI QAS or the ISO/IEC 17025 standard. The non-compliance is in two general areas: technical and quality management system. For the technical area, staff were not competent (lack of completed training) and were using inadequate procedures (not fully validated and/or inadequately written). For the quality management system, there was a failure to address these issues before any casework was performed and a failure of not stopping casework when a complaint was received and/or when management including the DNA technical leader became aware of these issues."*

ANAB stated that DFS accreditation would continue in all areas of the laboratory. However, based on this report, Mayor Bowser imposed a suspension of DNA testing at DFS.

Root Cause Analysis: May 2015 - June 2015

The Director and several senior managers separated from DFS and Dr. Roger A. Mitchell, Chief Medical Examiner for the District of Columbia, was appointed as Interim Director of DFS. In May 2015, Mayor Bowser provided a million dollars from Contingency Funds and directed Dr. Mitchell to determine the root cause of the issues raised and asked that he take action to correct identified deficiencies. Dr. Mitchell hired two consultants, Dr. Jenifer Smith and Dr. Katherine Theisen, to work with members of DFS to conduct an internal review of events leading to the self-suspension of DNA testing. An Independent Review Response (IRR) team was formed consisting of DFS Deputy Director of Training, Brittany Graham; DFS Deputy Director of Quality, Karen Wiggins; and outside consultants. A root cause analysis was conducted and several management recommendations were implemented. Additionally, an intense six month training program was initiated within the FBU. In June, ANAB returned to assess the DFS IRR plan and interviewed employees to determine whether or not the corrective action plan was sufficient to preclude ANAB from suspending the DFS Forensic Science Laboratory ISO 17025 accreditation. Upon conclusion of the physical assessment, ANAB

approved and accepted the DFS IRR corrective action plan, cited no nonconformities and made no changes to the FSL ISO accreditation certification.

Response and Change: July 2105 – December 2015

On July 17, 2015 Mayor Bowser appointed Dr. Jenifer Smith as Acting Director of the Department of Forensic Sciences. Within the first 30 days of her appointment she spoke to staff, stakeholders and the media about her vision for DFS.

In October 2015, Mayor Bowser provided additional funds to supplement the FY16 DFS budget. Under her *Safer, Stronger DC* plan, DFS received 8 million dollars to alleviate case backlogs in the FBU, Firearms Examination Unit (FEU) and Latent Fingerprint Unit (LFU) of the FSL Division. The additional funding also provided several temporary positions for crime scene scientists and evidence specialists in the Crime Scene Sciences Division, and various forensic scientist positions and agency management positions based off of the IRR recommendations.

On November 3, 2015, Dr. Smith, following confirmation by City Council, was appointed as Director of DFS.

This report highlights DFS activities relevant to the newly established vision for the agency and the following goals:

- Be Independent but not Isolated from Critical Customers.
- Have Foresight with Insight formed by Hindsight concerning both Productivity and Quality.
- Deliver Exceptional Forensic Science to Inform Public Safety and Health Decision Making.
- Have Fiscally Responsible Leaders who Engage, Empower and Inspire using Best Management Practices.
- Provide Superior Training, Infrastructure, Tools and Resources to Ensure all Employees Successfully Accomplish the DFS Mission.
- Maintain a Diverse Workforce; Collegially Blending Youthful Enthusiasm with Experiential Wisdom.

Be Independent but not Isolated from Critical Customers

Engage Customers and Critical Partners

DFS has actively engaged our external stakeholders in multiple ways to strengthen our understanding of our customers' needs without jeopardizing the scientific independence of our organization. DFS holds regularly scheduled case review meetings with MPD and USAO to ensure case needs are met in a timely fashion and analysts are encouraged to discuss case status in order to ensure appropriate prioritization of analysis in support of on-going investigations.

DFS publically solicits feedback from the public and stakeholders via email communication at: *contactDFS@dc.gov* and *contactquality.dfs@dc.gov*. Also, DFS has launched a new procedure for handling complaints and inquires whether they are lodged by either internal or external sources. The **Policy and Procedures for Complaints and Inquiries** includes several milestones for handling any complaints and grievances received by DFS to ensure that such issues are acknowledged and addressed in a timely fashion. All complaints deemed to be of value trigger the creation of a Quality Corrective Action (QCAR) or Quality Preventative Action (QPAR) that will be addressed via the DFS Quality Management system as required by ISO 17025. The table below shows the number of inquiries and complaints received by DFS in May - Dec., 2015.

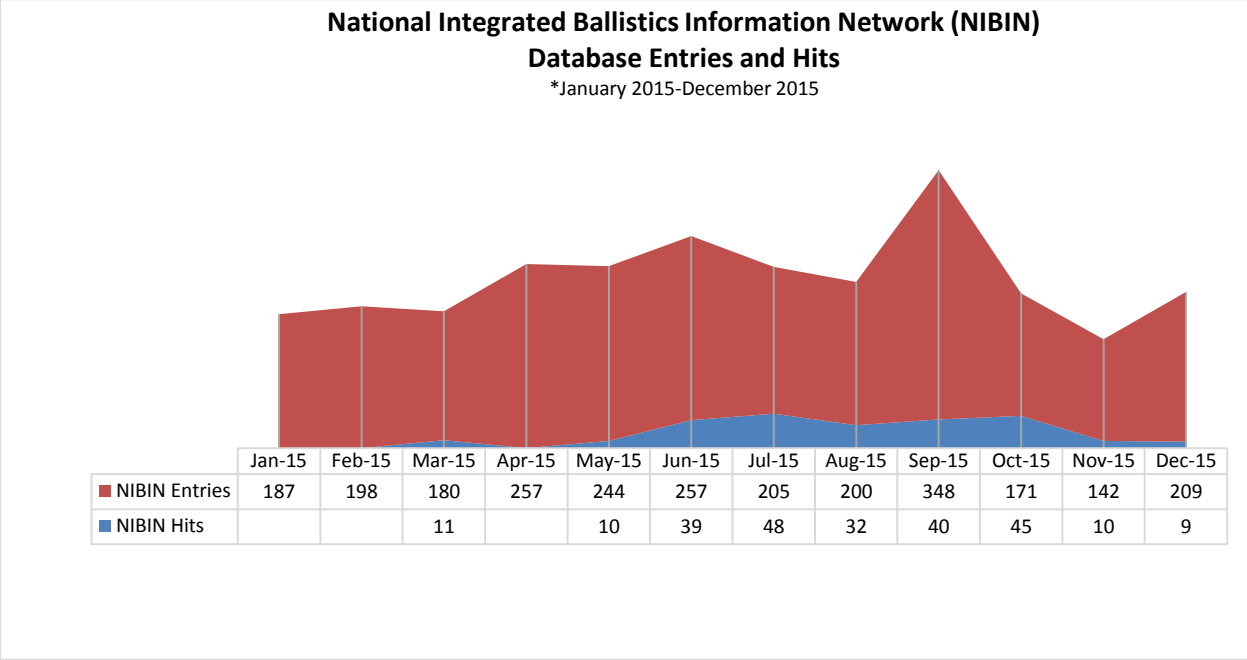
INQUIRIES AND COMPLAINTS RECEIVED BY DFS MAY-DEC. 2015

Source	Number of Inquiries	Number of Complaints
PDS	2	-
MPD	-	2
USAO	1	1
OCA	1	-
DC DYRS	1	-
DGS	-	1
USARMY	1	-
Reason Foundation	1	-
DC Resident	1	3
Total	**8**	**7**

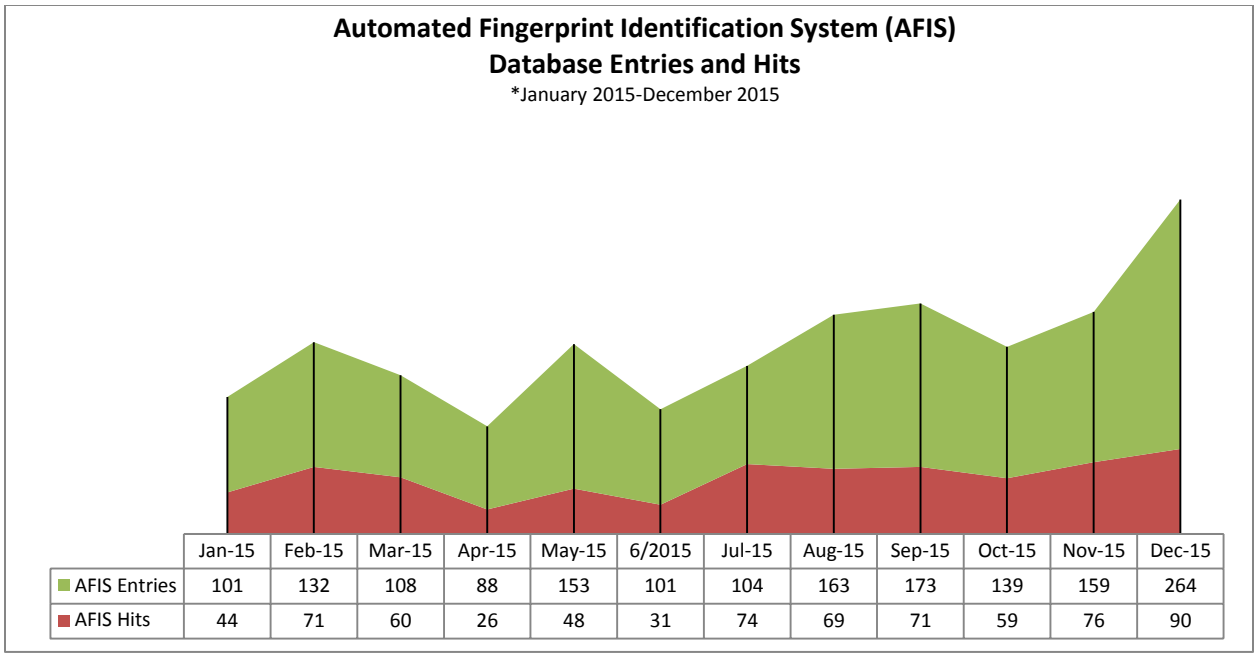
The statutorily required Science Advisory Board (SAB) has worked closely with DFS management to address technical issues of interest to DFS. The SAB met four times during 2015. The last two meetings focused on the issues raised by the Internal Review Team, the training program for FBU as well as the validation and implementation of the new DNA mixture software tool, STRmix. The

SAB was informed of the status of several QCARS that were initiated following the ANAB and USAO reports. Implementation of the Laboratory Information Management System (LIMS) and creation of the Forensic Chemistry Unit were also discussed. The public has the opportunity to address the SAB at their quarterly meetings. The SAB meetings are advertised to DC residents through the DC Board of Ethics and Government Accountability (BEGA) website on the Boards & Commissions Meetings page. Agendas and Minutes of the SAB meetings are posted on the DFS webpage under the Open Government tab.

In 2015, DFS continued participation in critical national intelligence databases sponsored by federal law enforcement agencies such as the Federal Bureau of Investigation (FBI) and the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF). DFS analysts within the FEU contributed information to the National Integrated Ballistic Information Network (NIBIN) and analysts within the LFU utilized the Automated Fingerprint Intelligence System (AFIS). Two public forensic laboratories, the Erie County Central Police Services Forensic Laboratory and the Los Angeles County Sheriff Department were able to assist DFS during suspension of DNA testing by uploading suitable DNA profiles into the National DNA Index (NDIS) of the Combined DNA Index System (CODIS). In total, these laboratories uploaded 51 profiles which resulted in 18 NDIS hits to other investigations.



	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15
NIBIN Entries	187	198	180	257	244	257	205	200	348	171	142	209
NIBIN Hits			11		10	39	48	32	40	45	10	9



	Jan-15	Feb-15	Mar-15	Apr-15	May-15	6/2015	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15
AFIS Entries	101	132	108	88	153	101	104	163	173	139	159	264
AFIS Hits	44	71	60	26	48	31	74	69	71	59	76	90

CODIS HITS TO OFFENSES

Offense	# of CODIS Matches
B-I while Armed	1
B-II while Armed/Assault with Intent to Kill (AWIK)	1
Assault with Intent to Kill (AWIK)	1
Armed Robbery	2
Assault with a deadly weapon (ADW Gun)	1
Sexual Abuse, Child	3
Sexual Abuse, Adult*	3
Homicide	4
Possession of a Firearm	1
Carjacking	1
Total	18

DFS also became a participant in the Washington/Baltimore Crime Gun Intelligence Center (CGIC). The CGIC is a partnership between ATF, the Metropolitan Police Department (MPD), Prince Georges County Police Department and the U.S. Attorney's Offices in Washington, DC and Maryland. The CGIC's goal is to target and remove violent criminal offenders from the communities they threaten.

DFS is legally mandated (§5-1501.06) to make available all records pertaining to the analysis conducted in a particular case to the agency that requested the analysis. As such the General Counsel's Discovery Team averaged 36 requests per month (or 432 a year) during 2015. Due to the complex nature of discovery, requests can take up to 21 days for processing. Currently, there are

seven units which may produce materials that are discoverable: FBU, FEU, LFU, Digital Evidence Unit (DEU), CSS, and CEU, in addition to MPD files which are housed within the Agency.

Public Health Laboratory Division Establishes New Partnership

The Chemistry Unit (CU) of the Public Health Laboratory Division began working with the Department of Energy and the Environment (DOEE) and DC Water to establish an Environmental Testing Laboratory for the District. The CU has performed environmental testing as a reference laboratory for dozens of submitted samples, ranging from testing of unknown dumped toxic chemicals to polluted water specimens in the Potomac River. Currently, DFS is working with the Metropolitan Water Council of Government (MWCOG) to establish a testing capability for the entire region. To foster a close relationship amongst these agencies, DFS has provided subject matter expertise for toxic chemicals and their analysis. The goal of this new laboratory is to offer on-going and routine testing for the District's water enabling the mitigation of any detected contaminants before they reach the public.

Have Foresight with Insight formed by Hindsight concerning both Productivity and Quality

Previously DFS reported metrics using the Foresight approach and these productivity and efficiency statics were often tracked using unit devised Excel spreadsheets that were filled out with varying degrees of oversight. A concerted effort began in June 2015 to implement a robust Laboratory Information Management System (LIMS) in order to comply with recommendations made within IRR. In order to support the LIMS and other data centric systems, the DFS Forensic Technical Unit (FTU) deployed a fully functional data center, housing the entire information systems infrastructure for DFS on site. Completing this infrastructure was key to the accelerated deployment schedule of JusticeTrax LIMS, which went live on October 1, 2015. To date the LIMS system continues to keep track of all cases and evidence items received by DFS and throughout the first three months of operation LIMS held 18,824 evidence items from 1,903 cases.

Additionally, FTU completed a full version upgrade of the Chemware Horizon LIMS for PHL Division. Chemware Horizon LIMS is designed to optimize the laboratory operation by streamlining workflows, tracking samples and preparing reports for stakeholders. FTU also completed a deployment of infrastructure for direct messaging from the LIMS to the Centers for Disease Control and Prevention (CDC).

Deliver Exceptional Forensic Science to Inform Public Safety and Health

Public Health Laboratory Division (PHL)

Having established a fully certified, Tier 2 Chemical Terrorism (CT) exposure laboratory for the District from 2013-2014, the CU was selected in 2015 as one of four national laboratories to support the development of a new nerve agent exposure testing modality. This reflects the need to maintain a strong analytical presence in the nation's capital. The CU was asked by the CDC to develop a comparison study of high-throughput versus low-throughput testing methods. The results of this study were presented at the annual, national CDC Laboratory Response Network (LRN) Conference in Atlanta, GA. Following the conference, the CDC tested all CT laboratories in the LRN with a mass casualty scenario specifically involving the use of nerve agents. The CU successfully performed this exercise with all submitted specimens—with reported values submitted to the CDC within one working shift (approximately 8 hours). This response time was one of the fastest in the nation, averaging 24 to 48hrs.

The PHL also maintains a Tier 1 Division of Select Agents and Toxins (DSAT) laboratory to include a Biosafety Level 3 (BSL-3) laboratory. PHL has both the competency and capacity to test for Category A and Category B biological terrorism (BT) agents as well as detection of any emerging diseases. The PHL presently has six qualified scientists trained and approved by the US Department of Justice to perform testing for select agents. PHL is the single point of testing for suspect BT agents in our region. Suspect samples are submitted to the laboratory by the FBI for screening to determine the presence or absence of select agents or toxins.

PHL maintains certification by the Centers for Medicare & Medicaid Services (CMS) in accordance with Clinical Laboratory Improvement Amendments (CLIA). PHL provides clinical laboratory support functions such as maternal and child health; epidemiology and surveillance for communicable and chronic diseases; food product inspection for safety and purity; and screenings for alcohol and drugs of abuses, assess environmental quality (water and air), hazardous materials (asbestos, lead, mercury, etc.) and other biological or chemical community health hazards arising from the presence of petroleum and other toxic materials in soils.

In September, 2015 the PHL was involved in an on-going Salmonella outbreak investigation of a restaurant in DC. Over a 10-day period, the outbreak branched into two general areas of investigation. Food samples that were collected from the restaurant were tested for the presence of

Salmonella. PHL was able to successfully characterize DNA retrieved from Salmonella isolated from biological samples taken from hospitalized restaurant patrons. In total, nine patrons of the restaurant were identified to have contracted Salmonella with the exact same DNA "fingerprint". This information was provided to the CDC. After the outbreak, the restaurant removed specific food items off the menu and participated in food surveillance for 4 weeks (food samples were submitted to PHL on a weekly basis to test for the presence of Salmonella). Based on the original DNA profile submitted, the CDC determined that additional cases associated with the same restaurant chain and reported by other public health laboratories were related. The majority of cases were located in Los Angeles, California. Orange County public health officials confirmed Salmonella isolated from hospitalized patients who ate at the Los Angeles-based restaurant. In summary, the quick and proficient work of the PHL allowed for an association to be determined between the sick patrons and the restaurant in question, which led to the removal of those food items likely preventing other people from illness.

Working Behind the Scenes to Keep You Healthy

The PHL is constantly working to keep us safe from disease outbreaks through surveillance. Data analysis from the West Nile Virus (WNV) Surveillance program for summer 2015 revealed that there was a significant increase in the total number of positive WNV mosquito pool samples. In 2013 and 2014, the positive rates of the WNV mosquito pool were 1.2% and 10% respectively. However in 2015 it was observed that there was a 2.5 fold rate increase in the positive pools submitted as compared to 2014 positive pool rate.

Additionally, five positive human cases in the District of Columbia were detected by the PHL before the end of December 2015. The locations of the trap sites of the positive WNV mosquito pools were in all eight wards of the city; this information was sent to the District of Columbia Department of Health (DOH) Epidemiologic Surveillance Unit and the Vector Control Unit. These laboratory reports provided critical information for implementation of preventative and protective actions by DOH for the residents and visitors to the District of Columbia. Such collaborative efforts between DOH and DFS are imperative in providing positive public health outcomes.

The PHL Immunology and Virology Unit developed a novel procedure to detect the Measles and Mumps viruses in human blood. This new test is based on a rapid nucleic acid amplification test that allows for the detection of Measles and Mumps from a blood sample to be ascertained within 4 hours. The importance of this new test is illustrated by the recent reemergence of Measles and

Mumps due to the anti-vaccination campaigns. In fact, the CDC recently reported that the incidence of Measles and Mumps is the highest it has been in over two decades. This new diagnostic tool will allow PHL to rapidly diagnose Measles or Mumps to assist in quickly quarantining infections, helping to avoid an epidemic.

The Unit has also verified and implemented an immunological detection test for Lyme Disease. Lyme disease is a bacterial infection you get from the bite of an infected tick. This new test method allows for rapid screening of suspected cases of Lyme Disease, within the District, and will aid in the surveillance data reported to the CDC.

Forensic Science Laboratory (FSL)

The Forensic Science Laboratory Division (FSL) analyzes evidence submitted from criminal cases, including DNA, fingerprints, firearms, and digital evidence. The FSL consists of four units, the Forensic Biology Unit (FBU), the Firearms Examination Unit (FEU), the Latent Fingerprint Unit (LFU) and the Digital Evidence Unit (DEU). The DFS also provides expert witness testimony in defense of their analytical reports in the District's courts of law.

During 2015, the FEU had several interesting cases. One case involved a .45 Auto cartridge case that turned out to be a very special piece of evidence. A weapon associated with an assault with a deadly weapon (ADW) investigation was submitted to the FEU. Following a "test fire" of the weapon, images of the resulting cartridge casings were entered into NIBIN in September 2015. These images were correlated against the database and searched against evidence from D.C, neighboring jurisdictions and other jurisdictions across the country. The correlation of the .45 Auto cartridge case was reviewed a day later, and seven hits were developed from this item. Among those hits were two homicides in 2015 and two assaults in 2014. Using the NIBIN system FEU was able to quickly link a single firearm to multiple incidents over the past five years and leading to the conviction of a violent repeat offender.

Supplemental money provided to DFS in response to issues identified in April was used to procure contract examiner assistance for both the LFU and the FEU. Both units have applied these resources to reduce the workload within the units. In LFU, the external contractors supported LIMS implementation allowed LFU analysts time for LIMS training. The contract assistance was vital to ensuring priority cases were completed in a timely manner. Collectively, these contractors were able to produce about 140 case reports over the final three months of the 2015.

Additionally, LFU contractors also applied their Adobe Photoshop and digital latent photo skills to cases in the LFU leading to an increase in the number of prints entered into the Automated Fingerprint Identification System (AFIS) system.

DNA Testing – Down but not Out

DNA casework in the FBU was suspended following concerns being raised about the interpretation of DNA mixtures. Following the self-suspension of DNA casework, the entire staff of the FBU began an intensive, full-time, six-month-long training program that was conducted by a range of national and international experts in DNA mixture analysis. The training involved class instruction, practical exercises and homework assignments. Validation and implementation of STRmix was completed, placing FBU at the forefront of DNA analysis and interpretation. DFS is the seventh laboratory in the United States to evaluate and validate STRMix, a continuous probabilistic modeling software tool that assists FBU analysts in their interpretations of DNA profiles. The software is particularly helpful in providing consistency for interpretation of DNA profiles as well as making use of more of the information available within the forensic DNA profile. FBU completed validation testing in accordance with national guidelines set forth by the Scientific Working Group on DNA Analysis Methods (SWGDAM). Additionally, the members of the unit completed comprehensive training in order to understand, implement, operate and testify about the software and its use in forensic analysis within the US court system.

Outsourcing DNA testing started in May with approximately 75 backlogged sexual assault kits sent to Bode Laboratories for testing. Near the end of May, DFS began meeting with OAG, MPD and USAO to assess and prioritize DNA testing for investigations and pending prosecutions. In 2015, utilizing contingency funding supplied by Mayor Bowser, DFS outsourced 415 cases at a cost of $523,831 using the contingency funding originally provided by Mayor Bowser.

Crime Scene Sciences (CSS)

The Crime Scene Sciences Division is responsible for the collection of evidence from crime scenes in the District of Columbia and the storage and distribution of evidence while it is present within DFS. These services are provided seven days a week, twenty four hours a day. CSS consists of two units, the Crime Scene Unit (CSU) and the Central Evidence Unit (CEU). Currently processing of crime scenes within the District are handled jointly by MPD (CSID and CSSU personnel).

The Mayor's *Safer, Stronger DC* plan provided funding in FY16 to hire temporary CSSU personnel with the intention of preparing DFS to act as the primary agency for crime scene processing. DFS has actively hired personnel to fill these term positions.

CSSU recently acquired many new crime scene investigation tools such as the innovative Leica 3D Scanner, which allows scientists to accurately and precisely document crime scenes using laser technology. Eight scientists received training and they are prepared to handle homicides and police-involved shootings. This includes pre-production and post-production registration of scan data. CSSU also acquired two new supervisor vehicles (four wheel drive for inclement weather) for response to crime scenes. These vehicles have been outfitted with specialized equipment that may not be used on conventional scenes, but can be transported and deployed as needed.

Activity	
Total Crime Scenes	1777
Total Vehicles Processed	519

Have Fiscally Responsible Leaders who Engage, Empower and Inspire using Best Management Practices

Managing the Money

Contingency funding was provided by Mayor Bowser to ensure that the DFS had sufficient money to bring DNA services back on line and to address other issues identified by the IRR team. One million dollars of emergency contingency funds were provided to DFS in April, 2015. Below is a breakdown of how that money was spent from April through the September, 2015 (end of FY15). The majority of that funding was directed to critical outsourcing funds for DNA testing and consulting services for training.

Activity	Expenditures ($)
Corrective Action Planning-Consulting	**71,219**
DNA Testing Contracts	**523,831**
DNA Training/Software/Equipment	**314,972**
Quality Training/Audits	**23,250**
Total	**933,272**

Realignment

DFS is working closely with the District's Department of Human Resources to complete an organizational realignment of several positions to address emerging needs for forensic services and to ensure continuing coverage of our overarching core services: crime scene evidence collection, forensic science analysis, and public health laboratory diagnostic, analytical and emergency response testing. The organizational chart below represents realignment. Boxes in red indicate leadership changes since April, 2015. FY16 will be a year of transformation in DFS that will ensure better alignment of personnel to cover critical services and support functions.

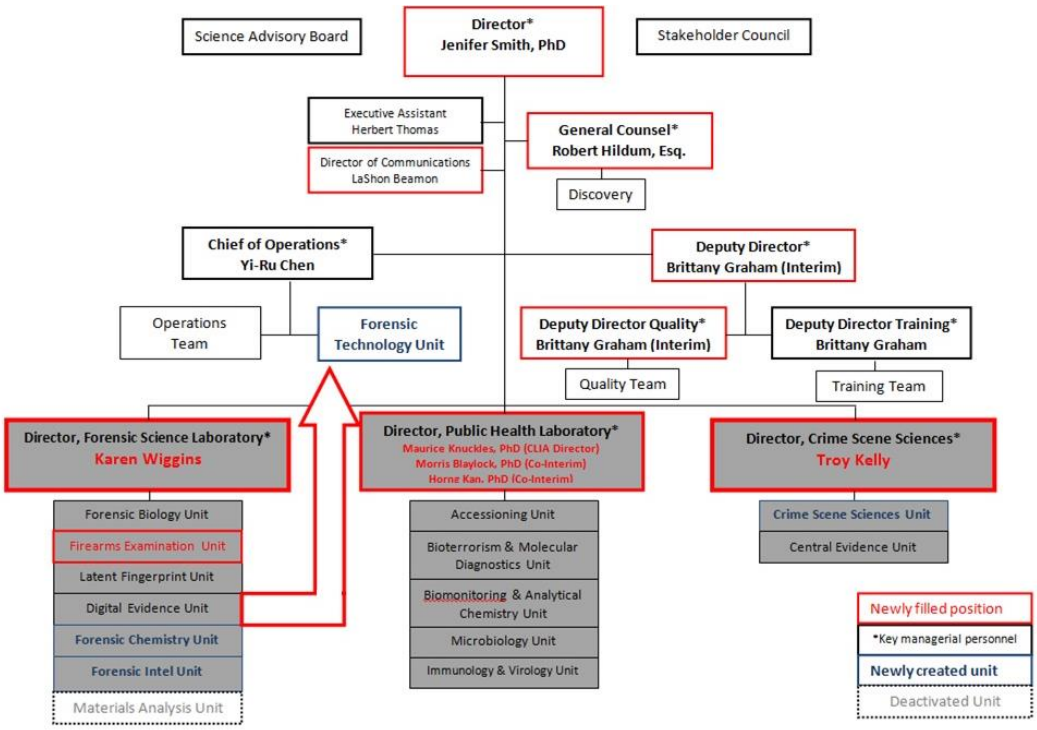


Fig. 1: DFS Organizational Chart as of 1/12/2016

New Services

New organizational units have been created within the FSL to help streamline and organize their evidence collection and testing. The Materials Analysis Unit and Digital Evidence Unit were deactivated and in its place three new units were created:

1. Forensic Technology Unit
2. Forensic Chemistry Unit
3. Forensic Intelligence Unit

The Forensic Technology Unit (FTU) has an Internal Systems Team and a Digital Forensics Team; members of these two teams frequently crossover for redundancy and professional development. LIMS coordinators are responsible for the LIMS applications and associated LIMS projects. The Internal Systems Team is responsible for all the Information Technology Infrastructure used by DFS and they address Data Center Management, deployment of applications, maintenance of the secured network and systems for Digital Forensics. This team works with OCTO to deploy appropriate solutions and provide IT Support. The Digital Forensics Team is responsible for Digital Evidence, Digital Forensics, and Analysis, Geographic Information Systems. All FTU personnel work on both teams where specialty and skills are appropriate or if redundancy is required.

In 2014, DFS was approached by the Drug Enforcement Agency (DEA) to create a testing environment for the identification of synthetic cannabinoids (synthetic marijuana), due to the overload of cases. DFS chemists worked closely with the Office of the Attorney General (OAG) to provide guidance and subject matter expertise in the creation of the proposed Synthetics Abatement and Full Enforcement Drug Control Act of 2015. DFS will open the Forensic Chemistry Unit for analysis of synthetic controlled substances in FY16.

The Forensic Intelligence Unit (FIU) will coordinate evidence identification for forensic examination with all contributors and stakeholders, process and track evidence related requests and provide forensic related statistics on service requests, evidence submissions, turnaround times and workflow efficiencies.

Provide Superior Training, Infrastructure, Tools and Resources to Ensure all Employees Successfully Accomplish the DFS Mission

Practice Makes Perfect

At DFS training opportunities are offered for professional development throughout the year in order to enhance and hone critical skills and abilities and also to keep up with new regulations and emerging technologies. Over the course of 2015, twenty-two forensic scientists completed field training and were released for independent crime scene response. They are currently responsible for scene response for all Part I offenses, with the exceptions of homicides and police-involved shootings. DFS scientists attended several training activities to include the National Institute of Standards and Technology (NIST) Organization of Scientific Area Committees Annual Meeting in Norman, OK.; Bloodstain Pattern Analysis training and the Forensic Leadership Course at West Virginia University. Eight scientists also completed the 40-hour training provided by Leica Geosystems and were certified as Public Safety Laser Technicians. Finally, ten scientists attended a five day shooting reconstruction training and two scientists attended a 40-hour forensic photography course in Baltimore, MD.

All DFS staff received training concerning entry and tracking of evidentiary items using the JusticeTrax LIMS to ensure successful implementation of this critical management tool.

Quality is Job One

The Quality Assurance Team of DFS consists of Quality Assurance Specialists that work with all DFS staff to maintain the DFS Quality Management System. Recommendations from the IRR Team included moving all Quality Assurance Specialists who were previously embedded within laboratory units, to the Quality Assurance Team that reports directly to the Deputy Director of Quality. That change was implemented in June, 2015. Additionally, a recommendation to conduct quality culture training to strengthen the DFS Quality Culture was implemented. DFS Deputy Director Dr. Catherine Theisen conducted mandatory "Quality Culture" training in September 2015. Topics addressed were Department Operational Manual 14 Training and Development, Ethics, Competence Awareness and Root Cause Analysis. To accommodate those who could not attend the initial session, the training was recorded and made available. Additional quality assurance training courses were conducted to include Root Cause Analysis Training and ISO/IEC 17025:2005 Internal Auditor Training.

Currently two divisions, FSL and PHL are accredited. PHL maintains compliance with Centers for Medicare & Medicaid Services' Clinical Laboratory Improvement Amendments (CLIA) regulatory guidelines and DFS maintains ISO/IEC 17025:2005 accreditation for various activities within the FSL division. The Quality Assurance Team addresses all DFS qualities corrective actions and conducts internal audits of DFS protocols, procedures and QA practices. They also prepare DFS for all external audits.

In 2015 there were four major audits conducted. They are listed in the table below.

Audits	Description	Date	Status
FBI Quality Assurance Standards (QAS)	Annual audit of the FBU for CODIS	11/30- 12/1/2015	ANAB Audit Completed
ISO/IEC 17025:2005 Standard	Annual surveillance assessment of the DFS FSL for continued laboratory accreditation	9/28-29/2015	ANAB Audit Completed

ISO/IEC 17025:2005 Standard	External Audit Assessment of FSL following ANAB report April, 2015	6/11-12/2015	ANAB Audit Completed
Division of Select Agents and Toxins (DSAT) CDC	Bi-Annual audit of the PHL concerning select agents and toxins for BSL3 capability.	8/18-19/2015	CDC Audit Completed

Maintain a Diverse Workforce; Collegially Blending Youthful Enthusiasm with Experiential Wisdom

As senior managers separated from DFS, steps have been taken to fill all critical management positions. Interim managers were found to lead all of the Divisions and to date; two of those Divisions (FSL Director and CSS Director) have now been permanently filled. DFS is in the process of seeking a permanent Director for the Public Health Laboratory. DFS has an extensive hiring plan and process that will result in the recruitment and placement of 70 individuals by the end of FY16. This includes 50 term positions supported by the FY16 supplemental funds.

The majority (37) of these positions will be in the CSS Division. They will be filled by the end of May 2016 and training of CSS personnel will be completed by the end of June. Recent passage of emergency legislation, that allows DFS to hire retired MPD officers, will ensure that officers with experience in crime scene processing and firearms examination will be available to continue as civilian employees with DFS.

In the Spotlight

DFS is very proud of their scientists continued effort to perform forensic research and present their findings at nationally recognized conferences. Stephanie Williams, from FSL, presented her thesis research at the Spring Meeting of the Mid-Atlantic Association of Forensic Scientists on May 21, 2015 in Cambridge, MD. In the January and March 2015 editions of the American Academy of Forensic Sciences' Journal of Forensic Science, Ms. Williams was the lead author on two scientific articles entitled "Columnar-Thin-Film-Assisted Visualization of Depleted Sebaceous Fingermarks on Nonporous Metals and Hard Plastics" and "Comparison of the Columnar-Thin-Film and Vacuum-Metal-Deposition Techniques to Develop Sebaceous Fingermarks on Nonporous Substrates."

Additionally, forensic science supervisor Kim Clements co-chaired a panel discussion at the NIST International Symposium on Forensic Science Error Management in Arlington, VA with fellow NIST Organization of Scientific Area Committees Bloodstain Pattern Subcommittee member Elizabeth Toomer of the Naval Criminal Investigative Service.

"Next Generation" DFS

Through a thorough recruitment and retention process the DFS Internship program seeks to attract the next generation of employees. The program is comprised of highly qualified interns who assist DFS units in meeting their goals and initiatives. Interns have been placed in units such as the Public Health Lab, the Forensic Biology Unit, the Latent Fingerprint Examination Unit, the Central Evidence Unit and the Office of the Director. Their academic level varied from undergraduate juniors to second year graduate students from institutions such as George Washington University, Virginia Commonwealth University, Northern Arizona University, Long Island University, University of Maryland, Howard University, Ferrum College and the University of Vermont. During the internship, each intern is tasked with a project accompanied with professional development opportunities to enhance their learning experience. These activities include, but are not limited to: Resume Writing & Interviewing, Job Search Workshop, Ride-along with the Crime Scene Unit and a chance to attend an autopsy with the Office of the Chief Medical Examiner.

DFS also relies on its internship program as a source of hiring. Thus far, select interns have been offered full-time employment at DFS in the Legal Unit, the Operations Unit and the Forensic Biology Unit. The remaining interns have been offered an intern extension where they have the option of working for the same unit or diversifying their knowledge through another unit.

Looking Ahead to 2016

With all that happened in 2015 DFS is excited for the upcoming year: with the recent organizational adjustments, new funding opportunities, and structural changes. Initiatives for 2016 include validation and implementation of innovative Next Generation Sequencing methods to be used within PHL and FSL. The power of this technology will allow DFS to perform DNA sequencing testing in a matter of hours instead of days. It has been used by other jurisdictions to identify novel pathogens, such as the SARs and MERs viruses, variations in antibiotic resistance, and source tracking of food borne pathogens. Together this technology will give PHL the capacity to perform a wide variety of surveillance and analytical methods to help safeguard the District from outbreak

and bioterrorism scenarios. In addition to helping PHL, forensic biology laboratories have begun to discover the full potential of this technology. FSL will explore the potential to more fully characterize DNA in a single experiment by analyzing combinations of markers simultaneously using next generation sequencing. Ultimately, this additional DNA information may increase the significance of the evidence collected from the crime scene.

Finally, FBU will recommence testing of evidence for the presence of DNA in early 2016. In addition to the implementation of STRMix, the unit will update all of the standard operating procedures, implement a DNA specific LIMS and redesign the lab processing structure to better meet the needs of their stakeholders.

The future is bright for DFS.