

U.S. Customs and Border Protection Laboratories and Scientific Services

History, Operations, and Emerging Capability Requirements

ADSA-CBP

June 2018



Laboratories and Scientific Services

- LSS is the scientific, technical, and forensic arm of U.S. Customs and Border Protection.
- **The LSS Mission Statement** is *To provide rapid, accurate, and reliable forensic and scientific services.*
- **The LSS Vision Statement** is *To be the country's foremost forensic and scientific organization that ensures the nation's safety, security, and prosperity.*

Brief History of LSS

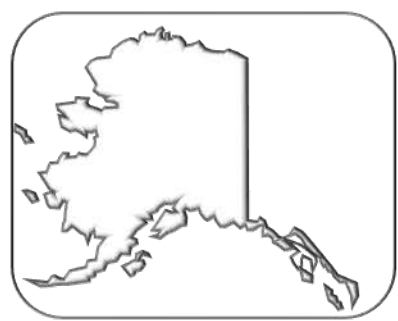
- Tariff Act of 1848 – Authorized the hiring of pharmacists and physicians to work on Customs appraisal teams.
- Tariff Act of 1883 – Required that sugar importations be classified by “polarimeters,” and therefore use of scientific equipment for trade enforcement
- 1892 – First Customs laboratory established in Philadelphia, PA
- 1936 – Nine regional Customs Laboratories are reorganized under a Headquarters Division of Laboratories
- 2001 – U.S. Customs laboratories become the first federal laboratories to be accredited by the International Standards Organization (ISO) for 17025-Chemical and Mechanical Testing.
- 2003 – Laboratories and Scientific Services transitions with the U.S. Customs Service to U.S. Customs and Border Protection.

LSS Organization

- The Laboratories and Scientific Services (LSS) Directorate falls under CBP's Operations Support Office.
- The LSS Executive Director is Dave Fluty
- LSS Divisions:
 - Headquarters
 - 7 Full Service Field Laboratories and numerous satellites
 - Springfield Laboratory
 - 24/7 Teleforensic Center
 - Interdiction Technology Branch



LSS Laboratories and Offices



San Francisco



Los Angeles



Chicago



New York



National Capital Region



Savannah



Houston



San Juan



LSS Scope of Work in Brief

- Conduct technical analysis for trade-enforcement purposes
 - Laboratory analysis
 - Technical reviews of trade enforcement documentation
- Perform forensic analysis for law-enforcement purposes
 - Latent print processing and examination
 - Digital forensics
 - Narcotics enforcement
 - Crime Scene Investigation
- Provide direct support to CBP and DHS operators
 - 24/7 scientific and technical “reachback” support
 - Mobile Border Security Operations at CBP and DHS’s front line
 - Technical training
- Lead technical authority of CBP’s NII and Tunnel Detection programs

LSS Quality Program

- It is the responsibility of LSS to carry out testing and analysis activities to meet the requirements of the ISO 17025 Standard, ASCLD Accreditation, and to satisfy the needs of its customers.
- The LSS Quality System provides testing that is acceptable, adequate, dependable, and economic.
- Each laboratory employs a dedicated Quality Manager who is responsible for the quality system and its implementation.



Trade Enforcement Activities



Trade Enforcement

- LSS analyses imported good for compliance with CBP and other U.S. Government laws and regulations
- Specific areas of focus:
 - Proper identification and tariff classification
 - Anti-Dumping/Countervailing Duty enforcement
 - Country of origin/trans-shipment circumvention
 - Admissibility/Import safety
 - Intellectual Property Rights
 - Commercial Gauger and Laboratory Program



Trade Enforcement Analysis – “Inorganic”

- AD/CVD for Steel and Steel Products
- Proper identification of metals and alloys
- Classification of stones, granite, and marble
- Proper identification of ceramics, glass, and glassware
- Product safety determinations of lead in children’s products



Trade Enforcement Analysis – “Organic”

- Identification of chemicals
- Confirmation/quantification of active pharmaceutical ingredients
- Sugar quota analysis
- Analysis of petroleum and petroleum products
- Classification and safety of food products
- Classification of polymers, plastics, and rubbers



Trade Enforcement Analysis - Textiles

- Fibers and yarns – natural and synthetic – for classification
- Analysis of fabrics and apparel for classification and water resistance
- Footwear analysis
- Paper, wood, and leather goods

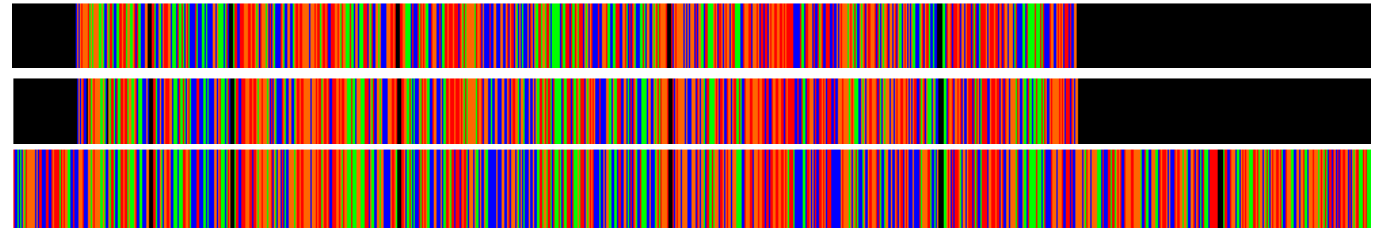


Trade Enforcement – AD/CVD

- Anti-Dumping Orders and Countervailing Duties (AD/CVD) are issued by the Department of Commerce, which CBP enforces at the border
- LSS provides analysis for AD/CVD evasion scheme investigations
- Catfish – DNA barcoding analysis for identification
- Steel – chemistry composition for classification
- Honey, peanuts, pistachios, garlic –analysis for country-of-origin



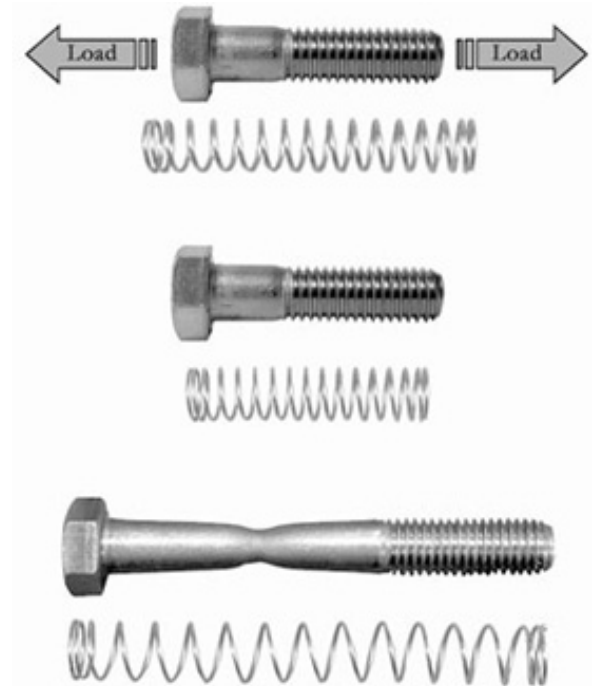
DNA Barcoding samples



A) *Pangasius bocourti* (basa fish) vs. B) *P. hypophthalmus* (Iridescent shark) vs. C) *Ictalurus punctatus* (channel catfish)

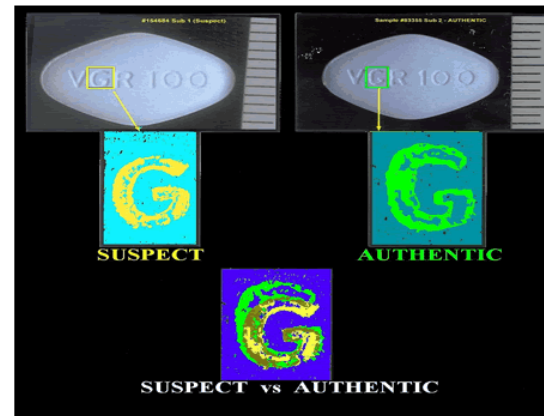
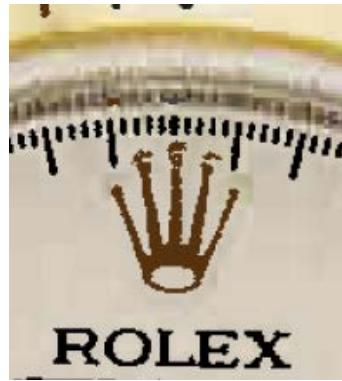
Trade Enforcement – Import Safety

- LSS performs screening and analysis for product safety events:
- Melamine and cyanuric acid in wheat gluten/pet food
- Melamine in milk and milk-containing products
- Diethylene glycol (antifreeze) in toothpaste
- FDA-banned antibiotics in seafood and honey
- Lead and hazardous metals in children's products
- Fastener/bolt safety and tensile requirements



Trade Enforcement – Intellectual Property Rights

- Intellectual Property Rights (IPR) enforcement involves registered product information and trademarks
- Visual comparisons to authentic samples
- Technical analysis for trace chemicals
- Digital analysis for electronics



Forensics

“scientific tests or techniques used in connection with the detection of crime”

“the application of scientific techniques to law enforcement investigations”



Forensics Overview

- LSS analyses evidence for law enforcement purposes and presents findings as expert witnesses in courtroom proceedings
 - Digital Media Operations
 - Latent Print Processing and Examination
 - Controlled Substances/Narcotics
 - Crime Scene Processing
 - Palynology/Pollen Analysis

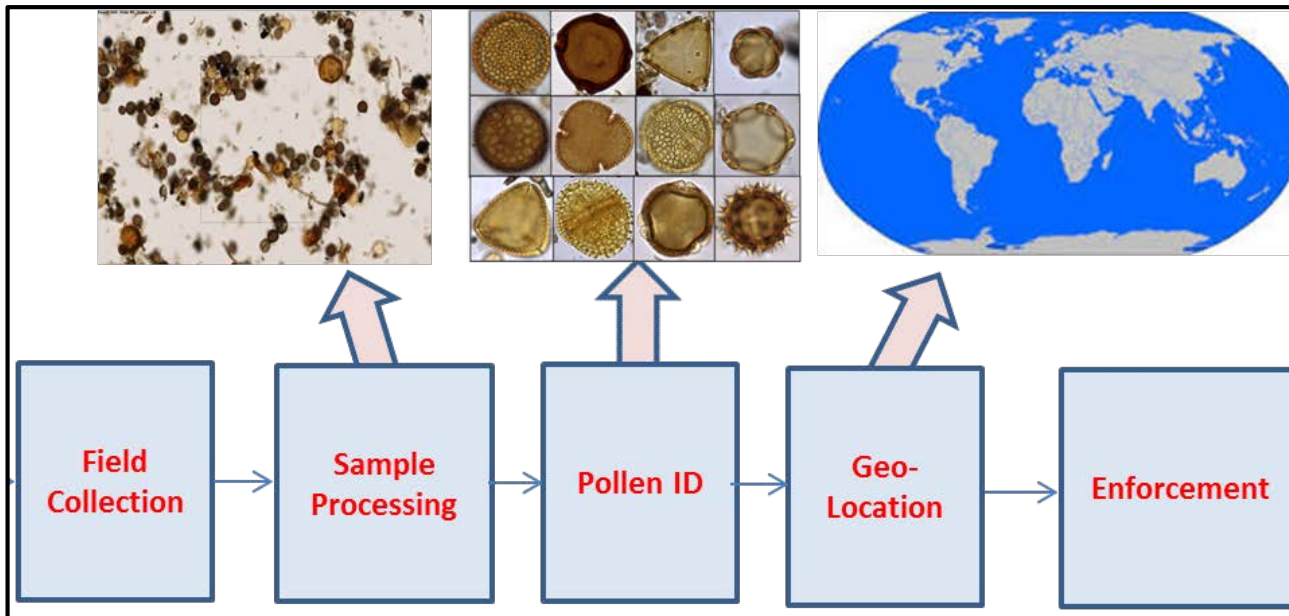
Controlled Substances/Narcotics

- LSS laboratories analyze evidence for the presence of controlled substances and listed chemicals:
 - Zero tolerance – cocaine, marijuana, heroin, amphetamines
 - Designer drugs/novel psychoactive substances – “Spice” cannabinoids, “bath salts” cathinones, fentanyl/opioids
 - Pharmaceuticals – DEA-scheduled substances, unapproved new drugs (FDA), counterfeits
- LSS’ confirmatory analysis is typically required for final legal prosecution



Palynology

- Palynology is the study of pollen grains and spores, with forensic palynology used to assist in geolocation/origination of evidence for law enforcement and intelligence-gathering purposes.
- LSS employs country's only full-time forensic palynologists.



Other Technical Activities



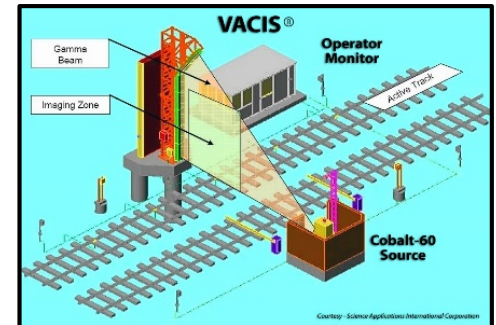
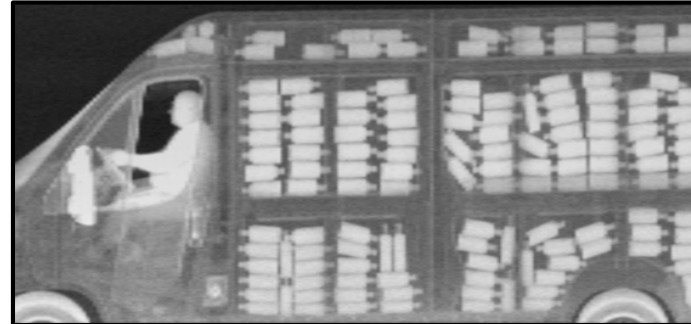
Mobile Border Security Operations

- LSS field scientists deploy on mobile laboratories to CBP's front line with advanced technology and skillsets.
- Support trade enforcement, counter-narcotic, forensic, and anti-WMD efforts



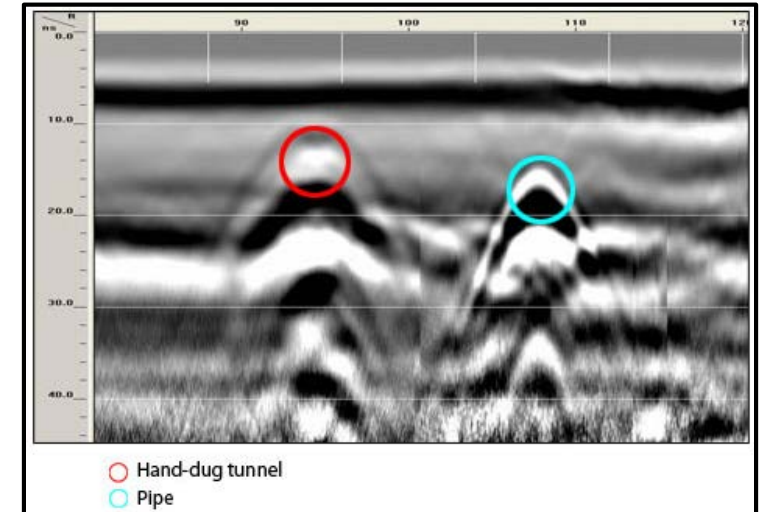
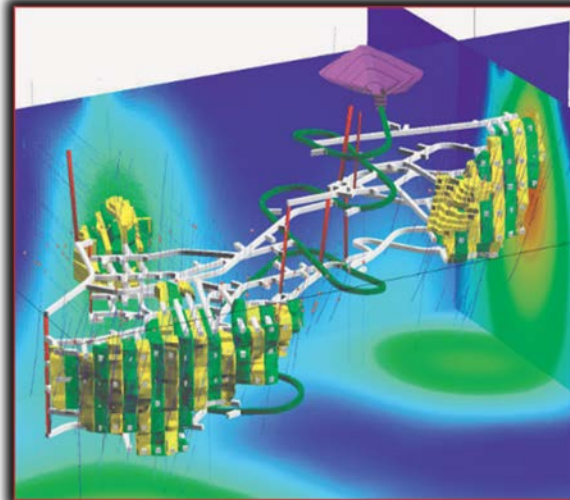
Non-Intrusive Inspection (NII) Program

- OFO develops operational requirements for NII that LSS will program-manage to meet CBP's enforcement and inspection missions
- LSS undertakes Acceptance Testing (FAT and SAT) of NII systems
- LSS provides expert advice and assists in evaluating new and emerging NII technologies as the Lead Technical Authority.



Tunnel Detection Program

- Test & Evaluation of new and emerging tunnel detection technologies in support of CBP's Cross-Border Tunnel program.



LSS' Emerging Capability Requirements





Homeland Security

<https://www.cbp.gov/about/labs-scientific-svcs>