

*Environmental Protection Agency's
Laboratory Enterprise Essential Products and Services:
Recommendations to Increase Coordination and Performance*

Executive Summary

The U.S. Environmental Protection Agency's (EPA) Laboratory Enterprise Forum (LEF) was established under the Science and Technology Policy Council (STPC) in July 2015. This cross-Agency Forum focuses on improving the effectiveness, efficiency, and collaboration across EPA's Laboratory Enterprise. In June of 2017, the LEF was tasked with assessing the services provided by EPA's Laboratory Enterprise, evaluating the value of those products and services in the context of EPA's mission of protecting human health and the environment and the Agency's strategic goals ([FY 2014-2018 EPA Strategic Plan](#)), and providing recommendations for making the Laboratory Enterprise even more effective through continuous improvement. The Laboratory Enterprise consists of EPA's Program, Regional and Research laboratories.

An essential component of this study was the identification and use of quantitative and qualitative approaches to characterize the products and services from EPA's Laboratory Enterprise, explain how the Enterprise supports EPA's mission, and to demonstrate the value these products and services provide to customers and stakeholders. The study provides data that can be used to identify processes, procedures, and other approaches to improve effectiveness and efficiency.

The LEF initially identified major products and services categories offered by the Laboratory Enterprise. Once these categories were determined, a data collection tool was used to collect information across the Laboratory Enterprise on these products and services for Fiscal Year (FY) 2017. Additional information was also collected from across the laboratories to provide greater context and a more complete understanding of the Laboratory Enterprise's efforts. The information in the report will help improve the Agency's understanding of the value provided by its Laboratory Enterprise system, and its ability to communicate this value both internally and to parties outside the Agency (e.g., the Office of Management and Budget - OMB, the U.S. Government Accountability Office - GAO, the States, etc.). Through this report, the Agency will gain a better understanding of the categories of functional products and services (as opposed to individual products such as research papers or reports) that are provided, approaches for improving effectiveness and efficiency, and how the laboratories complement each other to collectively form a world-class laboratory enterprise.

**EPA's Laboratory Enterprise
Value Statement**

EPA's Laboratory Enterprise provides expert knowledge and unique capabilities to address environmental and public health concerns on a national, state, local, and tribal level using the latest state-of-the-art and innovative approaches. The Enterprise is specially positioned to advance communication, cooperation, and management activities across the three Agency laboratory types, as well as with other federal and non-federal entities, to provide consistent and effective environmental analysis, data collection, and other customer-driven scientific and technical functions. These functions ensure that EPA continues to produce world-class scientific results to make informed decisions about our nation's most pressing environmental and public health concerns.

Laboratory Enterprise Functional Products and Services

Mission Support Functional Products and Services

The Laboratory Enterprise identified six core products and service categories that are key for EPA programs and regions to meet their mission, using quality science to protect environmental and public health:

- Sample analysis;
- Field sampling, field measurements, and monitoring;
- Method development, validation, and evaluation;
- Tool development and use;
- Technical assistance; and
- Training and education.



Source: EPA

In FY 2017, EPA laboratories provided extensive sample analysis (~1,088,000) and supported a wide range of customers, stakeholders and programs. While 14 of the 21 labs indicated use of a Laboratory Information Management System (LIMS) for the sample analysis data, ~90% of the analyses were not conducted on equipment that were part of a LIMS. In the field, the Labs collected samples (~111,700), conducted field measurements (~379,600), and undertook monitoring. Monitoring was conducted at 1,572 sites, which resulted in billions of data points used to prepare products for decision-making.

The Laboratory Enterprise also provides a variety of other products and services. In FY 2017, the Enterprise developed, validated, and/or evaluated nearly 300 analytical methods. Over 300 different types of tools have been developed by the Laboratory Enterprise to support both EPA and its myriad of stakeholders protecting human health and the environment. These tools are unique, both in structure and application. The most common forms of technical assistance provided by EPA's Laboratory Enterprise in FY 2017 were providing reference standards to states, localities, and tribes (over 4,200 instances), followed by assisting with technical inquiries/support or troubleshooting requests associated with measurement methods (over 3,900 instances) and performing or supporting risk assessments (approximately 2,500 instances). Additionally, the Laboratory Enterprise plays a critical role in training and educating students, partner organizations, and others to help prepare the next generation of scientists dedicated to environmental protection and public health. In FY 2017, the Laboratory Enterprise trained approximately 68,000 people, e.g., EPA and state staff, and members of the public.

Scientific Excellence Functional Products and Services

In addition to products and services that support the EPA's mission, the Enterprise is also dedicated to creating and supporting scientific excellence. The Laboratory Enterprise has institutionalized practices that promote credibility, transparency, and quality assurance practices to support the Agency's commitment to crucial scientific needs, producing the highest quality scientific information for environmental decision-making, and making data more publicly available.

The report also calculated the numbers of: labs and centers conducting peer reviews, external accreditations held by EPA laboratories, and datasets generated. In FY 2017, respondents indicated that: 1,400 scientific products were peer reviewed externally (most of which were reported by the Office of Research and Development [ORD]), EPA labs hold 19 external accreditations, and EPA datasets include qualitative and quantitative data pertinent to EPA's Laboratory Enterprise. Datasets support internal and external decision-making and assist EPA's collaborative partners (local, state, and tribal agencies or other federal agencies) in generating their own datasets. The report provides descriptions of highlighted datasets.

Recommendations

While EPA's Laboratory Enterprise produces world-class scientific results that inform decisions about our nation's most pressing environmental and public health concerns, there are always opportunities to increase effectiveness, efficiency, and collaboration within the Laboratory Enterprise. Recommendations include:

Leadership

Greater focus in the following areas:

- Reaffirmation or refinement of the Agency's vision for the Laboratory Enterprise and increased intra-agency communication and improved coordination of management processes.
- Continuous evaluation and tracking by refining the FY 2017 data collection tool to improve the quality and consistency of future data gathered across the Laboratory Enterprise.

Data Management

A high priority need for improving the Laboratory Enterprise centered on approaches to strengthen data management capabilities by:

- Greater use of automated systems to promote more consistent data collection, storage, and management (e.g., greater adoption of Laboratory Information Management Systems [LIMS]).
- Improving accessibility and availability of datasets through the Environmental Dataset Gateway (EDG) to ensure the Agency maintains a culture of transparency and openness with the public.

Functional Areas

Data call respondents also highlighted the following operational activities needing focus:

- Establish goal that approved Quality Assurance Project Plans (QAPPS) should be in place for 100% of projects that include components of the Laboratory Enterprise by FY 2020.
- Develop best practices and approaches for planning scientific activities that promote effectiveness and efficiency in laboratory and field work.
- Increase use of existing equipment's capacity using a database system to search available equipment within the Agency, creating processes to prioritize equipment purchasing and identify opportunities for equipment reuse.
- Increase efforts to maintain a well-educated, experienced workforce by retaining seasoned personnel's knowledge and investing in the future thought leaders within the Agency through professional training opportunities.
- Enhance intra-agency coordination and collaboration on sampling and method development activities to safeguard best practices and prevent redundancies in data gathering procedures.
- Establish a tool similar to TechTracker, developed by ORD, to track and coordinate technical assistance efforts across the Agency at the federal, state, local, and tribal levels.