

How the NJDOH-ECLS uses the CDC-APHL Fellowship Program to increase capacity and improve public health service provision

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Introduction

The New Jersey Department of Health (NJDOH) – Environmental & Chemical Laboratory Services (ECLS) expanded its range of services significantly to better address emerging public health concerns in the past 10 years. Beyond water testing and emergency preparedness, ECLS developed:

- Biomonitoring of specimens for >120 chemicals
- Food testing (toxic metals and organic compounds)
- Cannabis testing (potency, metals, cannabinoids)
- Environmental tissues (fish for metals, PFAS, etc.).

This effort required analytical method development, community outreach, and data management and analysis. The expansion of activities also required various disciplines and expertise. ECLS leveraged the great opportunity created by the CDC-APHL Public Health Laboratory Fellowship Program (PHLFP) to successfully onboard 18 fellows since 2021. While the fellows provide their talents and efforts to ECLS, the extensive experiences and mentoring expertise of the ECLS also provide great training opportunities to the fellows, matching the core goals of the PHLFP, i.e., training and development of the future public health workforce. The recent creation of Environmental Health and Informatics fellowships have proven invaluable to ECLS.

Methodology

Develop a scientifically-sound training project

A successful project brings value to the host agency, provides training and experience for the fellow, and is interesting and engaging for the fellow.

Find a good match

ECLS mentors look for a good match for the project and the hosting program. Refining a search entails:

- Filtering by geographical preference
- Matching fellows' interests with project
- Reviewing resumes/references
- Fostering open dialogue in interviews
- Identifying fellowship/long-term goals



Implement the fellowship project

NJDOH and its mentors support fellows by providing:

- Basic training on safety, data integrity, and more
- Project specific training (e.g., instrument, skills)
- Guidance on project implementation
- Advice as requested by the fellow (career, etc.)
- Networking opportunities with NJDOH and the field
- Professional development (leadership, communication, presentation skills, and other soft skills)

Results

ECLS has had 18 Environmental Health or Informatics fellows since 2021 to work on a variety of initiatives in one or two of following programs: Biomonitoring (NJB) - 6; Chemical Threats (CT) - 5; Data Management & Analysis (DM&A) - 3; Metals - 5; and Organics - 1.

The fellowship experience is resoundingly mutually beneficial. Examples of the projects, fellow and mentor feedback, and outcomes are detailed below.

PROGRAMATIC EXPERIENCE

Six NJB and DM&A fellows worked on NJB projects (NJHANES and Prenatal Screening). They assured

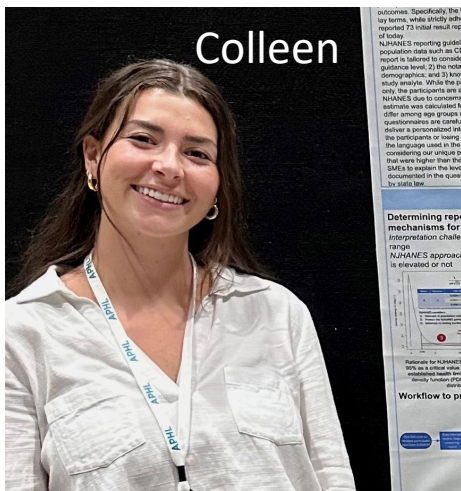


NJHANES subject recruitment and consent goals were completed by the deadline. Other significant contributions include coordinating field work, attending field visits, reporting, subject matter expert calls, and more. Their impact is invaluable.

Three fellows support expanding prenatal screening to new hospitals and data extraction from patient files. These efforts include logistics, training, and results communicating to providers and project partners.

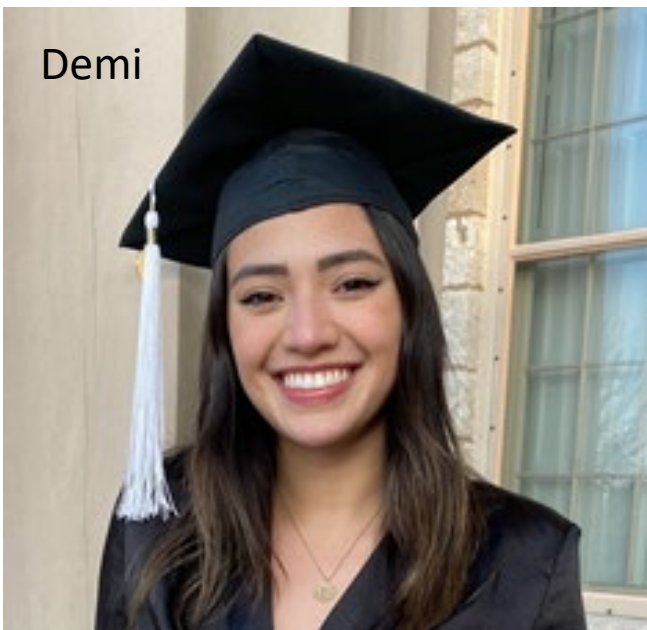
Beyond these projects, NJB fellows have worked on:

- Data analysis and presentation
- Outreach and education
- Research and literature reviews
- A mercury awareness campaign
- Website updates and maintenance



On the informatics side, NJB and DM&A fellows have learned coding to help support projects and initiatives. DM&A fellows support ECLS through:

- Onboarding a new LIMS
- Automating processes
- Geocoding
- Data cleaning and analysis
- Results reporting
- Data presentation



Fellows present their work at national meetings and contribute to other ECLS priorities like the Data Modernization Initiative.

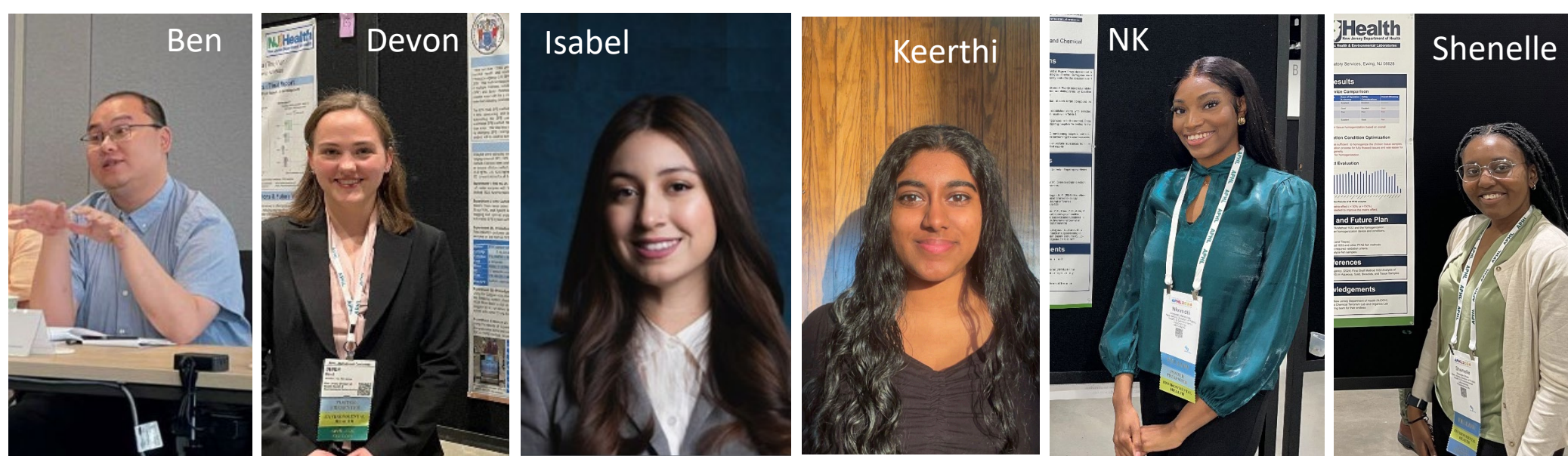
Results (cont'd)

LABORATORY EXPERIENCE

Ten fellows joined testing laboratories within ECLS in support of method development and sample analysis for core projects, new initiatives, and key grants.

Method development work by the fellows include:

- Metals analysis of dried blood spots
- Optimizing urine analysis for a combined metals method
- Solid phase extraction for PFAS in serum
- Automated sample preparation for LC-MS-MS methods
- PFAS analysis of non-potable water
- PFAS analysis of fish tissue
- Organic analysis of environmental tissues
- Terpenes in cannabis
- Drugs of abuse in urine

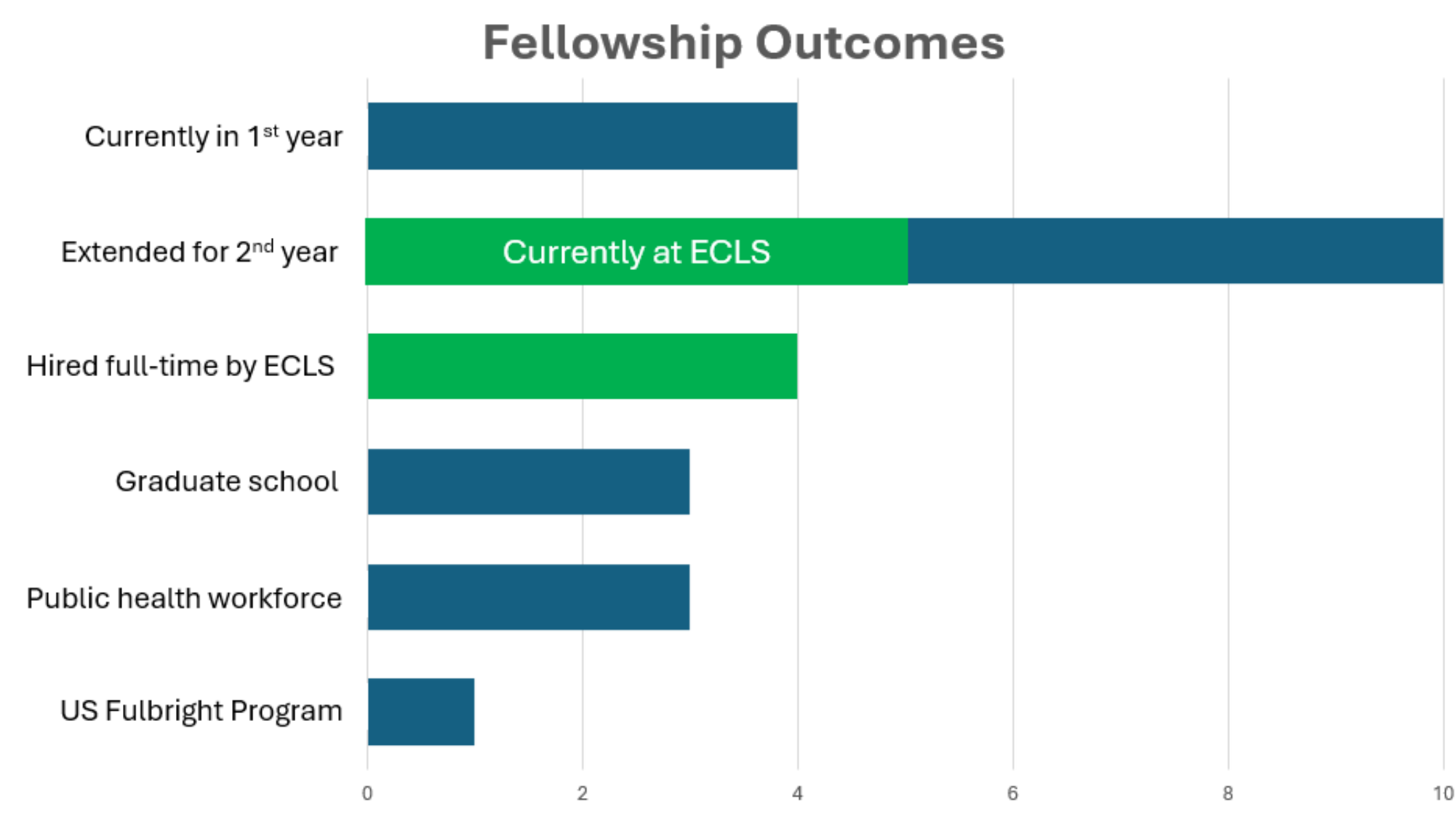


Sample analysis work by the fellows include:

- Blood and urine for toxic and nutrient metals
- Dried blood spots for metals
- Emergency preparedness testing in specimens
- Food samples for metals
- Organics in specimens
- Urine for drugs of abuse
- Water for PFAS



Most ECLS fellows choose to extend their experience for a second year. Upon completion, they tend to stay in public health, include with ECLS when possible.



Conclusions

The PHLFP, with joint efforts by APHL and state laboratories, successfully achieves its goals. ECLS fellows came from all over the country with different backgrounds and levels of education. Every individual contributed to their projects and to ECLS beyond expectations. They are professional, eager to learn, and bring fresh ideas and perspectives. During this time, ECLS hosted a CDC associate and multiple interns. Mentors prefer the PHLFP to other programs due to a combination of:

- Quality of candidates
- Long-term relationships (1-2 years)
- Ease of application and progress reporting
- APHL funds for project and professional development
- Productivity (9 new methods, >10K samples analyzed)

The mutually beneficial relationships are valued by all:

"I strongly recommend the fellowship program to public health laboratories. It has directly helped us improve public health outcomes."

"As someone passionate about medicine, exploring the analytical aspects of research has deepened my understanding and appreciation for public health."

"The fellowship program is an invaluable asset for public health laboratories that provides individuals with a passion for science and helping others."

"This experience has significantly sharpened my ability to critically analyze and manage complex laboratory data, far exceeding what I initially thought was possible for my professional growth."

"This fellowship was of great value and allowed us to meet all deliverables"

"The focus on diversifying my skillset through hands-on training is allowing me to apply my educational background in a practical, real-world setting through various projects and initiatives."

"This experience has been instrumental in developing my leadership skills, refining my existing expertise, and expanding my technical abilities."

"The supportive environment and collaborative spirit greatly enhanced my understanding of the critical role public health plays in prevention, which encouraged me to pursue a degree in Environmental Health Sciences."

"I had a great mentor who encouraged me to explore new opportunities, included me in various projects, and actively supported my growth."

"The APHL Fellowship allowed me to grow as a researcher, team member, and individual. I continue to apply many of the skills I acquired at the NJDOH"

"My mentor consistently encouraged me to go against the grain and follow the values of public health, even when it's hard."

"There is lots of structural support through the APHL, and there are many opportunities for me to explore topics I'm interested in at ECLS."

"Having the opportunity to contribute the 'behind the scenes' of public health was one of the most rewarding experiences."

"I built a strong network of colleagues in varying disciplines of public health."

"I gained invaluable transferable skills and knowledge that will help make me a better public health professional."

"I'm excited to learn more about survey methodology and to build on my statistical programming skills in a hands-on, collaborative approach."

ECLS will continue to find innovative ways to maximize the mutual benefits for all involved with the PHLFP.

