Announcing the NIH Recipients of the FY2019 HHS Green Champion Awards

The NIH has a strong history of projects and staff members that prioritize environmental stewardship. These projects have come in all shapes and sizes, have encompassed every environmental topic imaginable and have had a profound affect on the NIH. Equally, if not more important, are the people that bring these projects and initiatives to life. The HHS Green Champion Awards were established to honor these individuals that demonstrate measurable results towards integrating sustainability principles into the HHS mission and its daily operations. Staff from the NIH were heavily recognized for their efforts in FY2019, with a total of 17 award winners and 3 honorable mentions. The project summaries for the award winners can be read below. Please join me in congratulating the FY2019 HHS Green Champion Award winners!

SUSTAINABLE ACQUISITIONS

NIH Excess Property Product Catalog
Michael J. Kessler, Soujanya S. Giambone, Jayachandran A. Arumugam

The National Institutes of Health (NIH) Property Reutilization and Disposal Section developed and manages the online Excess Property Product Catalog. The catalog is accessible to internal and external NIH customers and provides a virtual means to screen excess serviceable property and equipment stored at the warehouse. It is user-friendly and easily accessible, making the catalog convenient to quickly search and view more than 7,800 excess property assets. The catalog search tool features intelligent single field key word search and advance filter options for customized results to optimize and streamline the screening experience. It also aids agency personnel to satisfy supply requirements in accordance with the Federal Acquisition Regulation, which mandates the prioritization of inventories, and as practicable, mandates agencies to obtain and use excess personal property as a first source. The development cost for the catalog was $189,000. The total acquisition value of property redeployments and reutilization for NIH through 2019 exceeded $14.8 million.

CHANGE AGENTS

NIH Crispin Hernandez

In 2012, Crispin Hernandez, Industrial Chemist in the NIH, Waste and Resource Recovery Branch, Office of Research Facilities, Office of the Director, implemented the NIH Chemical Surplus for Redistribution Program and the NIH Solvent Recovery Program. These two programs were piloted and orchestrated to support, comply and expand the NIH's sustainability effort under EO 13834, and the NIH Policy Manual 3032 (Waste Minimization and Management at the NIH). The programs captured the attention of all 27 Institutes and Centers at the NIH main campus and off-site facilities. Mr. Hernandez continues to save the NIH Research Community thousands of dollars in procurement and disposal costs through the management and coordination of these programs. Since inception, the Solvent Recovery Program saved a total of $485,547, and the Chemical Surplus for Redistribution Program generated a savings of

$858,291. In addition to these savings, the programs have diverted 37,498 pounds of recovered solvents and 23,534 pounds of surplus chemicals from the waste disposal process.

NIH Leading Sustainability by Example (NIH)
Minoo Shakoury-Elizeh, Daman Kumari, Barbara Zwiesler

In FY 2019, this group spent a great deal of time advocating for sustainability at various levels of the NIH. They served as the voice of the NIH scientific community to senior-level management at the Sustainability Management Team meetings and were intimately involved with their Green Team and the Sustainable Lab Practices Working Group. The group represented the NIH at international sustainability gatherings such as the 2019 International Institute of Sustainable Laboratories Conference. Their communication throughout the NIH and beyond introduced countless individuals to the benefits of sustainability. Perhaps most importantly, this group actively promotes green practices in their own labs and empowers others to do the same. Because of their efforts, ethidium bromide was replaced with Green-Glo, new collections for reusing Styrofoam packaging materials were organized, freezer management was improved, and many more projects were implemented. The group was crucial in successfully implementing the NIH Green Labs Program and their lab was one of the first labs to be certified. This group relentlessly promotes sustainability within the NIH and provides a model for everyone else to strive towards.

ELECTRONIC STEARDSHIP

Upgrading the NIH/NIAID Research and Development Computational Facility (RDCF) Power Utilization Efficiency (PUE)
Barry Muffley, Phillip Smith, Judy Quasney, Dimitri Mallis, Brian Roach

The NIH National Institute of Allergy and Infectious Diseases upgraded and transformed the Research and Development Computational Facility (RDCF) from a legacy Trane Tracer Building Automation System (BAS) and non-redundant mechanical and electrical infrastructure, into an energy-efficient and redundant data center, which resulted in an annual energy savings of $147,656. To achieve these savings, the Office of Workplace Solutions embraced the government mandated initiatives that involved strong collaboration among design and construction engineers, data center operations staff, and Information IT personnel. Through sustained efforts and innovative use of new and emerging technologies, RDCF achieved energy savings by: (1) upgrading to Siemens Desiga CC BAS, (2) upgrading five industrial mechanical valves and redundant electrical infrastructure, (3) improving IT asset efficiency through the deployment of virtual computing and cloud technologies, (4) upgrading to energy saving software on all five uninterruptable power supply systems, (5) using industry best-practices for operating the data center in an energy-efficient manner, and (6) incorporating free cooling heat exchanger systems that capture energy savings through all 12 months of the year.

ENERGY AND FLEET MANAGEMENT

NIH NIEHS All-Electric Vehicles
Tim Schilens, Terry Wells, Heather Davis

The Facilities Management Branch at the NIH National Institute of Environmental Health Sciences Research Triangle Park Campus in North Carolina, reduced the site's carbon footprint by more than 30,000 pounds of carbon emissions, and fuel costs by $25,000 over a five-year period by using three all electric low speed vehicles for the Maintenance and Operations program. The low speed vehicles meet Department of Transportation safety requirements and are customized to meet the needs of the Maintenance and Operations department. Overall, the addition of a small box truck to carry tools and supplies, and a truck with a liftgate for moving heavy equipment has improved the department's ability to provide high quality service.

NIH Thermal Energy Storage
Mansour Haghjou, Alamelu Ramesh, Joe Nieves, Abdul Bhuiyan, Don Guan, Andrew Gomes, Larry Fuqua, Milton England, Darius Reid, Brian Clifford

NIH recently built a thermal energy storage tank system (TESS) that saves energy costs and increases the chilled water capacity and reliability at the Bethesda Campus in Maryland. It consists of a partially buried eight million-gallon storage tank providing 45,000-ton hours of chilled water at a discharge rate of 5,000 tons per hour, and stores chilled water produced by the chillers in the NIH Central Utility Plant (CUP) during off-peak hours. During the peak hours, when chilled water demand is high, the storage tank supplements the existing chillers' capacity. Since the ambient temperature is lower than that of the peak hours, harvesting chilled water using off-peak electricity increases energy efficiency in general. NIH's Bethesda Campus operates one of the largest chiller plants in the USA. From the CUP, chilled water is circulated through the campus via the chilled water distribution network. The buildings use the chilled water for climate control and for the cooling of equipment. The chilled water system is critical to the NIH mission and is essential for data centers, inhabitants, hospital, and biomedical research facilities. The TESS preserves energy through differential water temperatures with a cost savings of about $1.3 million in electric costs during the peak hours from October 2018 until September 2019. Additionally, TESS makes the plant's operation more flexible, and provides emergency chilled water due to power loss, chiller plant failure or pipe leaks.

NIH Freezer Challenge

The NIH held its first freezer challenge to reduce energy consumption from laboratory grade freezers within NIH laboratories. The inaugural challenge ran from January 1 to April 1, 2019. Laboratories were challenged to adopt one or more initiatives from a set of freezer management techniques: defrost freezers, discard samples, transfer samples to liquid nitrogen freezers, maintain an electronic sample inventory, barcode samples, consolidate samples, share freezer space, retire freezers, change the temperature setting of Ultra-Low Temperature freezers from -80 °C to -70 °C, store samples at appropriate temperatures and to adopt room-temperature sample storage. Eight labs and one biorepository participated in the challenge. Their efforts in this challenge will save the NIH 14,975

kilowatt hours, $12,647, and 48 metric tons of carbon dioxide-equivalent greenhouse gas emissions annually.

ENVIRONMENTAL STEWARDSHIP

NIH NIEHS Vivarium Animal Feed Composting Initiative
Neil Grove, Paul Johnson, Paul Poliachik, Bill Steinmetz, Tim Schilens, Dennis Will, Bill Stutzbach, Debbie Gaffney, Gordon Caviness, Kethard Thomas

The Comparative Medicine Branch at the NIH National Institute of Environmental Health Sciences worked collaboratively to successfully divert approximately 46 tons per year of used, unconsumed animal feed to composting. This reduced carbon emissions by 90,000 pounds and decreased consumption of natural gas by one million cubic feet. The effort also eliminated the use of 3,000 trash bags annually, representing a significant reduction in the use of plastics associated with vivarium operations.

NIH Construction and Demolition Waste and Debris Recycling Program
Mansi Mehta, David Mohammadi, Eduardo Saavedra-Rodiguez, Craig Upson, Timothy Adkins, Brian Kim, Daryl Moore, Thomas Meredith, Thomas Pfaffman

The NIH Bethesda Campus construction and demolition (C&D) waste and debris recycling program, commonly known as the Division of Environmental Protection (DEP) Construction Dumpster Program, began in April 2008, and continuously grows in scope. The program is strictly managed by DEP in collaboration with the NIH Site Selection Committee. Dumpster locations on campus are thoroughly reviewed and approved for construction projects to ensure compliance with NIH daily operation requirements to prevent pollution and protect the environment. In FY 2019, NIH generated 9,535 tons of C&D, recycling 8,173 tons with an 86% diversion rate. The program also recycled 705 tons of scrap metals in FY 2019, from building construction and renovation producing $38,500 of cost savings. The goal for the program is to comply with EO 13834 and HHS and NIH Sustainability Plans. The success of the program far exceeded sustainability goals to divert 50% of C&D, producing substantial cost-effective results to the NIH mission. The significant success and high demand led to placement of C&D recycling dumpsters on loading docks of 12 buildings for minor demolition and renovations projects on campus that do not require a dedicated dumpster. The program allows DEP to manage and track the data for accurate invoicing and reporting.

GOOD NEIGHBOR

NIH Spread the Warmth Initiative
Carrie Wellen, Elizabeth Custis, Audrey Murphy, Phuong Nguyen, Melissa Wheatley, Maureen George, Dr. Johnathan Hernandez, Dr. Andrew Mannes, Andrew McGowan

A team of NIH Clinical Center Nursing Department nurses and technologists on the Bethesda, MD, campus observed a significant amount of waste being produced each day from the protective covers

used for sterilized operating room tools. Each cover is a 48" by 48" sheet of cloth-like plastic that cannot be recycled and are very common in operating room settings. According to the EPA, these covers account for about 19% of operating room trash. The team was inspired by another hospital team that re-purposes the same material into blankets for the homeless. After developing a plan, the team created the NIH Spread the Warmth initiative, which is run entirely on volunteer efforts and contributions. These efforts resulted in 96 blankets being created, diverting 384 plastic covers from entering the landfill.

NIH Community Paper Shred Event

The first NIH community-wide paper shred drive was held on October 11, 2018, in front of Building 1 on the Bethesda campus. This event was the collaborative effort of the NIH Office of Research Services, Division of Amenities and Transportation Services, and the NIH Federal Credit Union, a partnership that has thrived for nearly 80 years. Since the inaugural event in October 2018, events were held in June and October of 2019. Due to continued demand for and awareness of protecting the environment and preserving its natural resources, the next shred event was planned for May 2020. Unfortunately, this event was cancelled due to health and safety concerns from the COVID-19 pandemic. Another event will be planned once conditions allow it. Events are free and open to the entire NIH community.

GREEN HERO VIDEO OUTREACH

NIH Spread the Warmth Video
Carrie Wellen, Phuong Nguyen, Elizabeth Custis, Maureen George, Virgil Thornton II

The Spread the Warmth Video was created by employees from the NIH Clinical Center to spread awareness about an initiative to recruit personnel to help make blankets for the homeless from re-purposed sterilized operating room surgical covers. At the time the video was created, the Clinical Center did not have enough volunteers to sew the surgical covers together into blankets. This short instructional video explains what the Spread the Warmth Initiative is and provides step-by-step procedures on how to make the blankets. The video has proved to be a valuable recruitment tool as well as an instructional video and is available on YouTube and as a website.

GREEN LABS

NIH Dr. Mary Ellen Urick

Dr. Mary Ellen Urick championed the incorporation of multiple daily green practices into the Reproductive Cancer Genetics Section laboratory of the National Human Genome Research Institute. Her practices led to reductions in electricity consumption, paper use, and plastic waste generation. Through coordination with colleagues and contractors, Dr. Urick also implemented and maintains the Thermo Fisher Scientific (TFS) Styrofoam Take-Back program at the NIH Main Campus Building 50. This program allows TFS Styrofoam shipping coolers to be returned for re-use, thus decreasing new production need. Dr. Urick also used the same program model to establish the return of the New England Biolab's Styrofoam from Building 50 for reuse or recycling. Through these programs, which are

maintained and overseen by Mary, an estimated 1,100 Styrofoam containers were diverted from trash in 2019. Styrofoam contains and is manufactured using chemicals that have negative environmental impacts and is not biodegradable.

User Engagement Strategy in the NIH Green Labs Program
Minoo Shakoury-Elizeh, Barbara Zwiesler, Daman Kumari, Thomas Bauer, Elaine Lamirande, Yinghong Cui, Mary Ellen Urick, Barbara Murphy, Bani Bhattacharya

The Green Labs Program (GLP) was developed at the NIH to encourage labs to implement and practice greening initiatives in laboratory environments. The use of a simple yet effective user-engagement strategy was essential to the successful implementation of the GLP. Having the NIH Laboratory staff engaged in the program since its inception aided in the successful programmatic adoption of the initiative. As part of the NIH GLP team, the users were involved in developing and implementing the program and assisting with the outreach and communication strategy. This strategy led to collaboration with the NIH Institutes and Centers and many other offices within NIH. Recognizing and rewarding labs with the NIH GLP certificate required engaging the senior leadership at the NIH Institutes and Centers. In addition, the program provided an opportunity for the GLP users to be role models by leading initiatives and providing guidance to their colleagues. The new techniques for collaboration and GLP engagement were crucial in promoting an overall behavioral change in adopting sustainability initiatives at NIH.

OPERATIONAL EFFICIENCY

NIH Carleen Klumpp-Thomas

Ms. Klumpp-Thomas developed new cleaning protocols for some of the most challenging and difficult to clean substances such as cells and other biological reagents, for both plates and pipette tips. She designed not only the experiments to validate the cleaning performance but also the associated work involving the use of specialized instrumentation to enable these parts to be cleaned. Through extensive instrumentation configuration, detergent research, consultation with instrument and consumable vendors, and experimental design and coordination with biologists, she developed techniques to clean both microplate and tips, savings thousands of plates and hundreds of thousands of tips in the past year alone. These savings equate to tens of thousands of dollars, which allowed more funds to be spent on actual experimentation as opposed to an ever-increasing amount of consumables. These savings continue to grow as more labs initiate high-throughput screening campaigns at the National Center for Advancing Translational Sciences. The result of Carleen's initiative is an ever-evolving set of cleaning protocols that can be customized for specific experiment types and that has been validated to allow the reuse of these parts which were previously used once and then discarded.

SUSTAINABLE DESIGN AND FACILITIES

NIH NIEHS Rall Building Public Space Renovations
Alison Karver, Debra Del Corral, Amanda Thompson, Rhonda Carroll

While the Rodbell Conference Center Renovation Project was initiated to resolve life-safety deficiencies, it was also an opportunity to improve the overall flexibility of the Center and to renovate the Rall Building Lobby at NIH's National Institute of Environmental Health Sciences (NIEHS). The conference facility was enlarged from a 197 to 300-person capacity that can be subdivided into three smaller spaces. These renovations and improvements encourage multi-lateral use of the space, as well as encourage on-site conferences instead of renting and traveling to offsite venues. The open storefront in the Rall Building lobby was enclosed with electrochromic glass that automatically adjusts according to the intensity of the sun, controlling heat load and glare while allowing sunlight in. The Mall Skylight Replacement Project also replaced existing single pane skylights with electrochromic glass. This dramatically improved the comfort and usability of these large central circulation spaces, and reduced heat load and glare. The projects to replace the skylights and the Main Entrance store front resulted in savings of over 40,000 KWH of energy and represent a coordinated sustainable design and renovation effort.

WATER USE EFFICIENCY AND MANAGEMENT

NIH NIEHS Rall Building Chilled Water Fan Coil Loop Piping Replacement
James (Victor) Stancil, P.E., Daniel Burk, Kyle Askins, P.E., Brian Harris

The NIH Office of Research Facilities, Research Triangle Park, completed the design and construction of a chilled water fan coil loop piping replacement project in the Rall Building. This project reduced pump energy as a result of clearing flow restrictions in the piping and eliminated the risk for catastrophic failure of corroded 40-year old steel pipes resulting in building flooding. The project used a phased approach to install the new piping while the existing piping was still in operation. The estimated annual water savings is 119,000 gallons, equivalent to 4,760 ten-minute showers or 901,300 bottles of drinking water.