Brookhaven National Laboratory

2020 Site Environmental Report

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In 2020, the United States was impacted by the coronavirus (COVID-19) pandemic, resulting in severe illness and death for millions in the United States and globally, interruption of economies and livelihoods, and the dramatic development of vaccines to fight the pandemic.

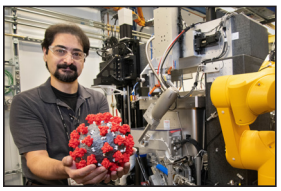
As with many businesses in the U.S. and worldwide, the impact for Brookhaven National Laboratory was significant, with two-thirds of its employees working from home and many operations delayed or stunted.

Remarkably, though, the Lab has maintained operations throughout the pandemic, with hundreds of employees working on site as essential staff to run scientific facilities and other mission-critical operations.

Heeding the call to serve and protect the nation and assist in the world-wide effort to develop vaccines and treatments for COVID-19, right from the start of the pandemic the Lab mobilized its scientific resources. Starting in the spring of 2020, Lab scientists began to focus their expertise and the Laboratory's unique scientific tools on National Virtual Biotechnology Laboratory-supported efforts, user studies, and research to address the challenges COVID-19 presented—from computational modeling, to drug-discovery experiments at the National Synchrotron Light Source II (NSLS-II), to exploring the properties of face coverings, and more.

Some of the most notable research findings conducted by scientists at Brookhaven Lab included development of a new mathematical model for predicting how COVID-19 spreads, an understanding of how the virus envelope protein behaves and promotes viral spread, and development of computer models that helped speed the discovery of drugs to combat the novel coronavirus that causes COVID-19, to name a few.

Additionally, researchers outside of the Lab harnessed the strengths of the Lab's world-class facilities to tackle the pandemic. A number of research groups used the NSLS-II to investigate the various proteins of the virus, creating the needed structural data that was used in various models and potentially in drug development. Notably, Pfizer scientists utilized the NSLS-II facility to research certain structural properties of their vaccine.



Lab employee Babak Andi holds a 3-D model of the coronavirus responsible for the COVID-19 pandemic. He's at the end station of the AMX beamline at Brookhaven Lab's National Synchrotron Light Source II, where scientists are studying virus proteins and potential inhibitor drugs.

The Laboratory also took action on behalf of the Department of Energy (DOE) to gather and distribute excess personal protective equipment to health care professionals working on the "front lines" in hospitals.

COVID-19 and the Environment

Despite the catastrophic effects of the pandemic on many aspects of life, an unforeseen consequence of the pandemic was a reduction in negative environmental impacts.

According to a National Institutes of Health study, "the pandemic situation significantly [improved] air quality in different cities across the world, [reduced greenhouse gas] emission, [lessened] water pollution and noise, and [reduced] the pressure on the tourist destinations, which may assist with the restoration of the ecological system."[1]

Likewise, the COVID-19 pandemic had significant impacts on transportation greenhouse gas (GHG) emissions at the Lab. Air travel GHG emissions dropped 4,756 MT CO_2e, a 66 percent decrease from fiscal year 2019, while employee GHG emissions decreased by 1,267 MT CO_2e, a 33 percent drop from fiscal year 2019. These transportation GHG emission reductions were due to the Laboratory's implementation of its limited operations plan (consistent with New York State and DOE guidelines) from March 23 to September 30, 2020.

The various impacts of COVID-19 on the Brookhaven Lab environmental program are discussed in greater detail throughout each chapter of this year's report.

About the Cover

The cover photo for this year's Site Environmental Report was taken by Douglas Beard, Radiological Control Supervisor for Cabrera Services, Inc., on Jan. 12, 2021, at sunrise from atop the "stack," one of the highest vantage points at the Lab for more than 70 years until its recent demolition. Beard captured the image while implementing radiological controls of the International Chimney Corporation (ICC) Commonwealth Mantis working platform, one of the primary tools ICC used for the Bldg. 750 Stack Demolition Project at Brookhaven.

This view, looking southeast, highlights how the Lab is situated in the heart of the Long Island Pine Barrens, a key natural resource of Long Island and New York State.

The lower photos were taken by Near Map Aerial Photography Services and show the comparison in parking volume before and after the pandemic at the NSLS-II and the Center for Functional Nanomaterials parking lots.

[1] *https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7498239/*




The Brookhaven National Laboratory Site Environmental Report is a public document that is distributed to various U.S. Department of Energy sites, local libraries, and local regulators and stakeholders. The report is available to the general public on the internet at http://www.bnl.gov/ewms/ser/. To obtain a copy of the report, please write or call:

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