National Institute of BUILDING SCIENCES™

NASA's POWER Project: Global Solar Insolation, Meteorological Parameter Data, and Web Services to Support Sustainable Building Design and Operations

July 31, 2024 | Session Overview

Speaker

Dr. Paul Stackhouse, Senior Scientist, NASA Langley Research Center

Moderator

Ben Nolan, Web Manager, National Institute of Building Sciences

NASA POWER Project Overview

The building industry is striving to adopt green solutions to make infrastructure more energy efficient to meet the 2050 net-zero climate goals.

Planning requires reliable environmental datasets that are crucial in designing, building, and maintaining the global built environment, as well as other energy-related processes and investments.

NASA's Prediction of Worldwide Energy Resources (POWER) Project informs decision-making and development for sustainable building design and operations by enabling public open discovery, efficient access, and convenient distribution of NASA's Earth Observations and atmospheric model datasets to support three focus areas: 1) renewable energy deployment and management, 2) sustainable infrastructure, and 3) agroclimatology applications.

On July 31, 2024, NIBS hosted a webinar with subject matter expert Dr. Paul Stackhouse, Senior Scientist, NASA Langley Research Center, who shared data products, including solar data from several NASA projects and meteorological data from NASA assimilation models that have been reformatted and disseminated to the public via a user-friendly web GIS-enabled based data portal through the POWER platform.

Dr. Stackhouse also covered the POWER Data Access Viewer (DAV), which features data consistent with ASHRAE Climate Design Conditions and has developed web image services showing building climate zones and their variability. Through these tools, data can be downloaded into multiple formats that support the infrastructure community, including CSV, Geo-JSON, and Energy Plus Weather (EPW).

Ben Nolan, Web Manager with the National Institute of Building Sciences, served as moderator.

NASA for Buildings

NASA develops, launches, maintains, analyzes, models, synthesizes, and distributes data from a large array of Earth-viewing satellite-based analysis and modeling data products.

These observations are related to Earth atmospheric properties, namely, atmospheric composition, weather and atmospheric dynamics, climate variability and change, water and energy cycles, carbon and ecosystems, and earth surface and interior.

"We're trying to understand the Earth's atmosphere as a whole," Dr. Stackhouse said. "There is a lot of data for the scientific research community that can benefit applied research, like the building community."

This data is available for research, and the material constantly is being updated and fine-tuned, according to new parameters that are needed for various communities.

The POWER Project: Research to Action

NASA's POWER Project improves the capability to integrate NASA Earth Observations and model data specific to surface solar irradiance and meteorological parameters into decision processes related to energy (renewable energy development), buildings (energy efficiency and sustainability), and agriculture (agroclimatology applications). The web portal is available at https://power.larc.nasa.gov.

Dr. Stackhouse went over several data products and surface measurement sites, including comparison of National Oceanic and Atmospheric Administration meteorological estimates with that of NASA research and a worldwide network of high quality surface solar measurements. The goal: Come up with statistics and tools to provide the scientific community with useful information on data quality that can be incorporated into the decision process.

Building Innovation Webinar Series

As part of our mission to continue conference education, NIBS launched a webinar series to reach more professionals on new technology, trends, groundbreaking tools, best practices, and workforce solutions.

It's our way of extending the Building Innovation annual conference beyond the in-person meeting.

The next webinar – Integrating BIM and Digital Twins: Unveiling a Position Paper for the AECO Industry – is scheduled for September 4, 2024.