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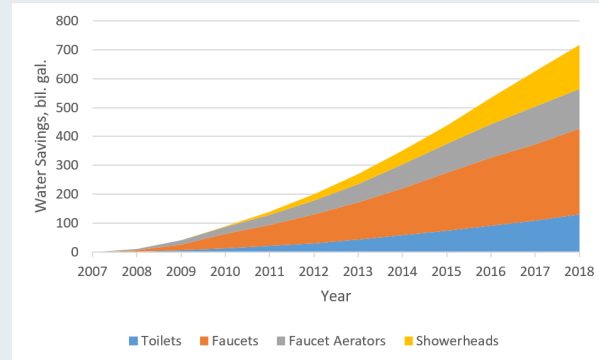


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Motivation

The nation faces tremendous costs required to maintain and improve its critical yet aging water and wastewater infrastructure. Increased water demand puts additional strain on water and wastewater treatment and distribution systems. Using water-efficient plumbing products extends the life of this infrastructure by reducing water demand; such water efficiency also lessens the energy needed to treat and convey drinking water and wastewater.

The US Environmental Protection Agency (EPA) is tasked with administering the WaterSense program to lower water demand by identifying and promoting water-efficient products, buildings, landscapes, facilities, processes, and services. Estimates of national water savings have provided critical feedback to the agency since EPA and LBNL first began tracking the program's impact in 2007.



WaterSense Residential Savings by Product

Research

LBNL developed mathematical models to estimate WaterSense impacts as annual water savings and the net present value (NPV) of the lifetime of savings from efficient indoor and outdoor products. No such method has been previously used to quantify current water and monetary savings or project future savings.

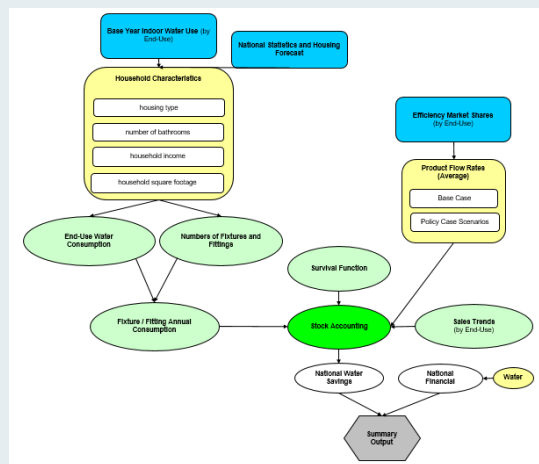
The National Water Savings (NWS) models enable EPA to evaluate the success of its WaterSense program. WaterSense-labeled indoor products include labeled toilets, faucets, showerheads, and faucet aerators for the residential sector; and flushometer valve toilets, urinals, and pre-rinse spray valves for the commercial and institutional (CI) sector. WaterSense-labeled outdoor products include weather-based irrigation controllers and spray sprinkler bodies. EPA places its WaterSense label on products that are more efficient than federal standards and meet a set of technical specifications for efficiency and performance. The NWS models forecast the amount of water that will be consumed by the residential and CI sectors with and without WaterSense-labeled products.

References

Schein, Jonah, et al. 2019. Methodology for the National Water Savings Models and Spreadsheet Tools – Indoor Residential and Commercial/Institutional Products, and Outdoor Residential Products. International Water Association's Journal of Water Science & Technology.

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Residential Model Flow Diagram

Technological Challenges

The EPA has a continuing need for modeling, analysis tools, and data research and collection that can quantify the success and potential benefits of the WaterSense program, as well as inform future developments. Ongoing feedback, data, and metrics are necessary to effectively gauge the impact of the program. Continued modeling of both current and future water savings helps EPA determine the program's focus and direction, as well estimate its benefits to stakeholders.