

WILDLAND FIRE RESPIRATORY RISKS

Every year, wildland firefighters are exposed to many of the same respiratory hazards that structural firefighters avoid by using Self-Contained Breathing Apparatus (SCBAs).

Unfortunately, wildland firefighters cannot use SCBAs as they must limit the load they carry and their need to resupply out in the field. (An SCBA tank can weigh as much as 40 pounds and is designed to last about 30 minutes.) Sore throats, headaches, and respiratory damage are common in the wildland firefighting community. A scarf is the only respiratory protection, which is minimal. A firefighter's participation in wildland firefighting usually ends when they are no longer willing to subject themselves to more respiratory damage.

During the 2018 California Camp Fire, many wildland firefighters reached their respiratory damage limit and retired from fighting wildfires. For some, the respiratory damage they absorbed also ended their structural firefighting careers.

DHS S&T'S WILDLAND RESPIRATOR

Wildland firefighters need a small, lightweight respirator that is easy to don and doff. Under the Department of Homeland Security (DHS) Science and Technology Directorate's (S&T) Wildland Firefighter Respirator (WFR) project, TDA Research is developing a respirator capable of removing airborne hazards in the wildland firefighting operating environment.

TDA's WFR contains a HEPA filter module that removes very fine particulates and a carbon sorbent to remove toxic gases. The TDA Research team is certifying the hip-mounted powered air purifying respirator units that meet this requirement.

IMPACT

Regular use of respiratory protection by wildland firefighters may reduce the inhalation of carcinogenic toxins, resulting in healthier firefighters and increased longevity of the wildland firefighter population. Longevity and improved health lead to a more educated and experienced workforce capable of more efficient operations, with lower medical bills and training costs.

This project was highlighted in Technologically Speaking, the official S&T podcast (<https://www.dhs.gov/science-and-technology/understanding-what-responders-need>). *Popular Science* recognized the WFR as being one of the top 100 new technology innovations of 2022.



IMPORTANT MILESTONES ACHIEVED

- Voice of the customer meetings were held with multiple firefighters to provide feedback on the prototypes. Input received proved invaluable in steering the designs toward acceptance
- An Operational Field Assessment was held at the Harbison State Forest, Columbia, SC, in May 2022

UPCOMING MILESTONES

TDA will continue to enhance the respiratory capabilities of the WFR while working to identify a manufacturing partner. These enhancements and extensive testing will lead to the assessments required for National Institute for Occupational Safety and Health and National Fire Protection Association certifications.

PERFORMERS/PARTNERS

First responders interested in assessing the prototype WFR include Los Angeles County Fire (CA), Olathe Fire Protection District (CO), Fairmount Fire Protection District (Golden, CO), South Carolina Forestry Commission, and the Colorado Division of Fire Prevention & Control.