

Special Issue on the Importance of Combustion Science to Unravel Complex Large Outdoor Fire Processes

Sayaka Suzuki

currently Tokyo Institute of Technology, Japan

Samuel L. Manzello

currently Reax Engineering, USA and Institute of Fluid Science, Tohoku University, Japan

The Combustion Institute would like to bring to your attention a recent special issue of *Combustion Science and Technology* prepared by Prof. Suzuki and Prof. Manzello.

Large outdoor fires are becoming an increasing danger to many countries throughout the world. Often seen in the news media are wildland fires that spread into urban areas. These are known as wildland-urban interface (WUI) fires. WUI fires have resulted in extreme situations throughout the USA and are most often associated with fire disasters in the Western part of the USA. Yet it is important to note that WUI fires are not merely a problem in the Western States of the USA but have occurred recently in Australia, Brazil, Canada, Chile, Israel, Italy, Portugal, Spain, South Korea, Russia, and the list continues.

Two other important components to the large outdoor fire problem are urban fires and informal settlement fires. Urban fires are perhaps the oldest, with these fires occurring for hundreds of years in many countries throughout the world. The informal settlement fire problem is the newest component to the large outdoor fire problem and has arisen due to the rise of vast informal settlement communities seen in Africa and Southeast Asia.

At first blush, large outdoor fire events appear overwhelming, so it is often hard to imagine what may be done to address this globally important problem. As part of this special issue of invited papers to *Combustion Science and Technology*, it is stressed that combustion science is more important than ever to address the large outdoor fire problem. By carefully considering the physics of the various flame spread processes, similarities amongst informal settlement fires, urban fires, and WUI fires clearly exist. These similarities have not been fully exploited and the research community often stovepipes research efforts to show uniqueness to collect funding, but this is not helping to solve the problems facing society.

Clearly, the research needs for large outdoor fires is vast and cannot possibly be dealt with in one special issue. Rather, the goal here is to highlight some interesting research being undertaken by research groups across the globe to bring missing pieces of combustion science to tackle this important global problem. Papers were invited on various aspects of large outdoor fires, with a special focus on wildland fires and WUI fires. Included topics consist of firebrand combustion, fire whirl combustion, gaseous and particulate emissions, to basic flame spread processes. The range of invited authors in this special issue is substantial and includes more than 50 authors working across multiple continents.

The guest editors dedicated this special issue to the memory of Mr. John Randy Shields, recently deceased. Mr. Shields was a geologist by training and worked in the fire research division at NIST for more than two decades. SLM and SS learned a great deal from Randy, not only about experiments but also on how to be sure you live your life doing what you believe is right. Randy was always glad to lend a helping hand and give advice to anyone that would ask. We really miss you, Randy.

The full editorial and all papers are available here:

[Combustion Science and Technology: Vol 195, No 13 \(tandfonline.com\)](http://tandfonline.com)