BIRA-IASB - CLIMATE SESSION 2

Date and time Friday 09 October, 16:00-18:00
Location WebEx (link will be communicated to all participants)

PROGRAMME

16:00 – 16:05 **Welcome and introduction**
by Dr. Martine De Mazière (BIRA-IASB)

16:05 – 17:00 **"Climate research at BIRA-IASB"**
by Dr. Simon Chabrillat (BIRA-IASB)

17:00 – 17:45 **"The Impact of Climate Change on California Wildfires"**
by Prof. Valerie Trouet (University of Arizona)

17:45 – 18:00 **Closing discussion**
moderated by Dr. Martine De Mazière (BIRA-IASB)

CLIMATE RESEARCH AT BIRA-IASB

Abstract

Simon Chabrillat will give an overview of the climate research performed at the Royal Belgian Institute for Space Aeronomy.

About the speaker

Simon Chabrillat has been developing and using models of atmospheric chemistry in the middle atmosphere (stratosphere and mesosphere) for 25 years. All his titles were obtained at the ULB: Civil engineer (1993), degree in external geophysics (1994), Doctor in Applied Sciences (2001). His thesis, "Modeling global change in the middle atmosphere", is the result of research started at the National Center for Atmospheric Research (Boulder, USA) under the supervision of Dr Guy Brasseur and Dr Gaston Kockarts.

At to the Royal Belgian Institute for Space Aeronomy, he is participating in the development of one of the first systems for assimilating satellite observations of atmospheric composition: BASCOE. This experience then led him to carry out the first extension to the chemical composition of an operational weather forecasting system at the Canadian Meteorological Center. After his return to BIRA-IASB, he formed a small team to implement BASCOE in an operational manner, to participate in the preliminary development of the future Copernicus system for monitoring atmospheric composition (GEMS, MACC) and later on in the operational implementation of this system (CAMS). Alongside these scientific services, he continues to research the couplings between chemistry and the dynamics of the middle atmosphere in the context of climate change.

The Impact of Climate Change on California Wildfires

Abstract

The rise in wildfire activity in the American West in recent years – exemplified by the severe wildfires in California this summer and fall of 2020 – is one of the most prominent and destructive features of anthropogenic climate change. Rising temperatures result in hotter droughts, longer fire seasons, drier fuels, and more difficult and dangerous fire-fighting conditions.

In California, the rise in destructive wildfires in recent decades can be attributed to a combination, or rather 'a perfect storm' of rising temperatures, a century of fire suppression, and expanding human development. To disentangle the roles of anthropogenic climate change versus 20th century fire suppression on California's fire conundrum, we need to put the current fire situation in a longer-term context and study fire history. This can be done by tree-ring dating and analyzing the fire scars left in the trunks of trees and stumps by past wildfires.

We collected and analyzed almost 20,000 such fire scars from 29 sites in the Sierra Nevada in California. Our resulting fire history spans the period 1490-1900 CE and shows a past Sierra Nevada fire regime of frequent, non-destructive groundfires. This groundfire regime was disrupted, however, by widespread and effective fire suppression starting in the early 20th century, which resulted in a century-long fire deficit and an unnatural build-up of fuels. Due to this fuel accumulation, recent wildfres are no longer low-intensity groundfires, but destructive crownfires that are difficult to control. Combined with anthropogenically forced heatwaves and an increase in wildland-urban interface, the fuel overload has led to the severe and destructive 2020 California wildfires.

About the speaker

Professor **Valerie Trouet** leads a research group at the Laboratory of Tree-Ring Research at the University of Arizona. She obtained her doctorate in applied biological sciences at KU Leuven in 2004 and has been doing research in dendrochronology - the study of tree rings - for 20 years. She is specialized in climate reconstruction and forest fires, and has published more than 60 scientific articles on this subject, notably in Nature and Science.

She recently published a book on dendrochronology for a wide audience, both in English ("Tree Story - The History of the World Written in Rings") and Dutch ("Wat bomen ons vertellen").