BUSHFIRE AIR TOXICS - WHERE THERE'S FIRE THERE'S SMOKE (AND PEOPLE)!

Fabienne Reisen, Min Cheng, Steve Brown and John Mahoney

CSIRO-Manufacturing & Infrastructure Technology, Highett, VIC

OBJECTIVE

Measure, evaluate and control the personal exposures of Australian bushfire fire-fighters to air toxics

- ⇨Assess exposure levels to air toxics in regards to Occupational Exposure Standards (OES)
- ⇨Determine key factors that determine exposure levels
- ⇨Identify situations of unacceptable risk

HEALTH RISK = LIKELIHOOD THAT HAZARD (= POTENTIAL FOR HARM) WILL BE REALISED

⇩

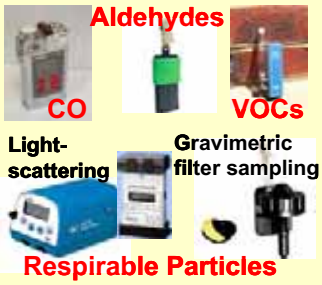
Requires knowledge of personal exposures to air toxics, in relation to fire-fighter tasks, fuel type, fire type, fire agency practices.

METHODOLOGY

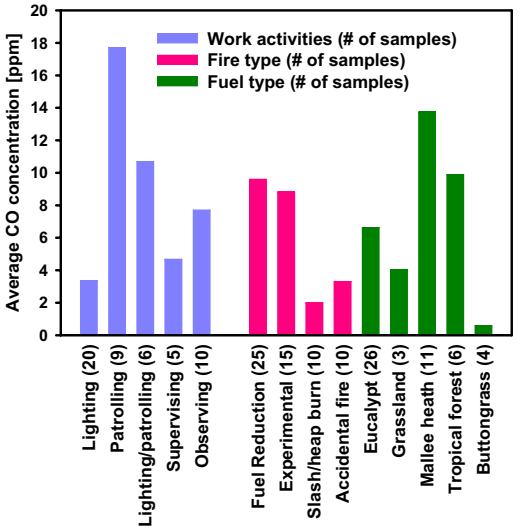
Sample bushfire air toxics - Carbon monoxide (CO), Aldehydes, Volatile Organic Compounds (VOCs) and Respirable particles - on 3 to 6 fire-fighters per burn or fire using personal monitoring devices.

Fire-fighters wearing sampling pack

Personal monitoring devices



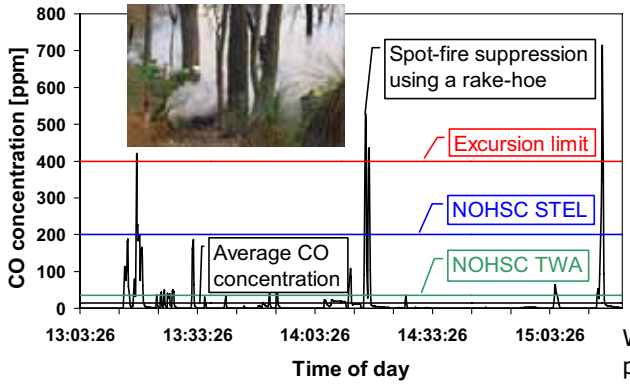
RESULTS & DISCUSSION



Personal exposure levels to CO by work activity, fire type and fuel type

Fire-fighters exposure to smoke during various work activities

Data-logger record of a fire-fighter's exposure to CO



SUMMARY

Key Air Toxics that may exceed OES include

- CO (primarily short-term exposures) – headaches, dizziness, reduced concentration
- Respirable particles– respiratory irritation, reduced lung function
- Formaldehyde - respiratory irritation, nasal carcinogen

Key factors that determine exposure levels include

work activities, fire types, fuel types

High risk situations:

- Patrolling/suppressing spot-fires > lighting
- Fuel reduction burns > accidental > slash burns

ACKNOWLEDGEMENTS

We thank the following agencies for their participation in the monitoring process: DSE, CFA (VIC); CFS, DEH (SA); Forestry Tasmania; ENSIS; NT Bushfire Council, Territory Wildlife Park, CSIRO-Sustainable Ecosystems (NT).

Contact: Fabienne.Reisen@csiro.au

CSIRO