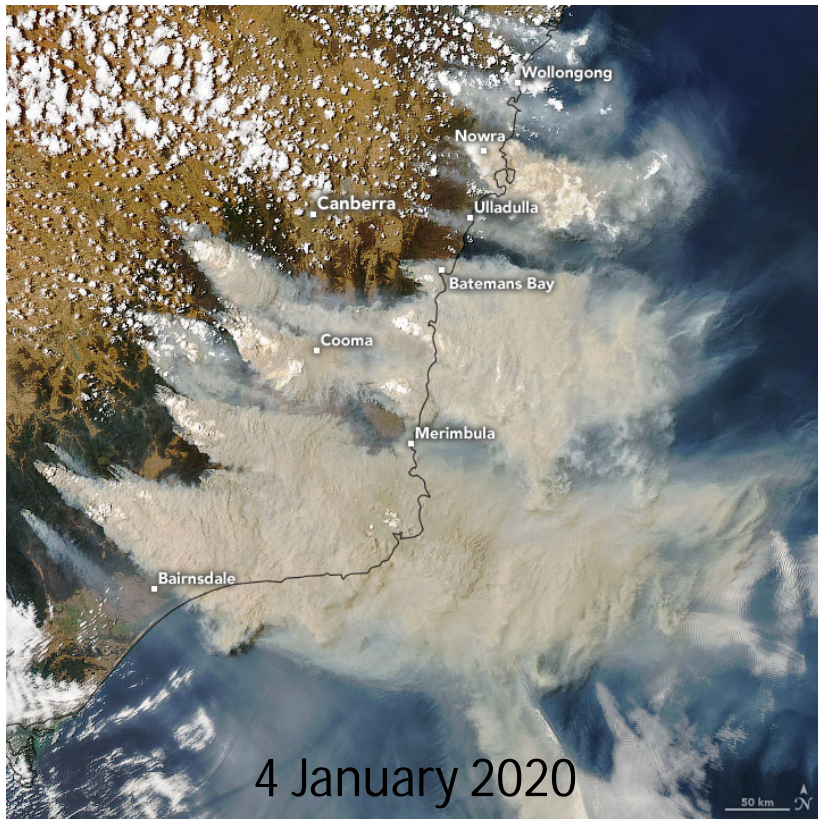# Real Time Smoke Impact Analysis for Decision Makers- Exploring Optimal Communication Pathways

Fabienne Reisen & Dylan Lynton| 24 August 2022

Air quality impacts from bushfires and burn-offs

4 January 2020

50 km

28 March 2022

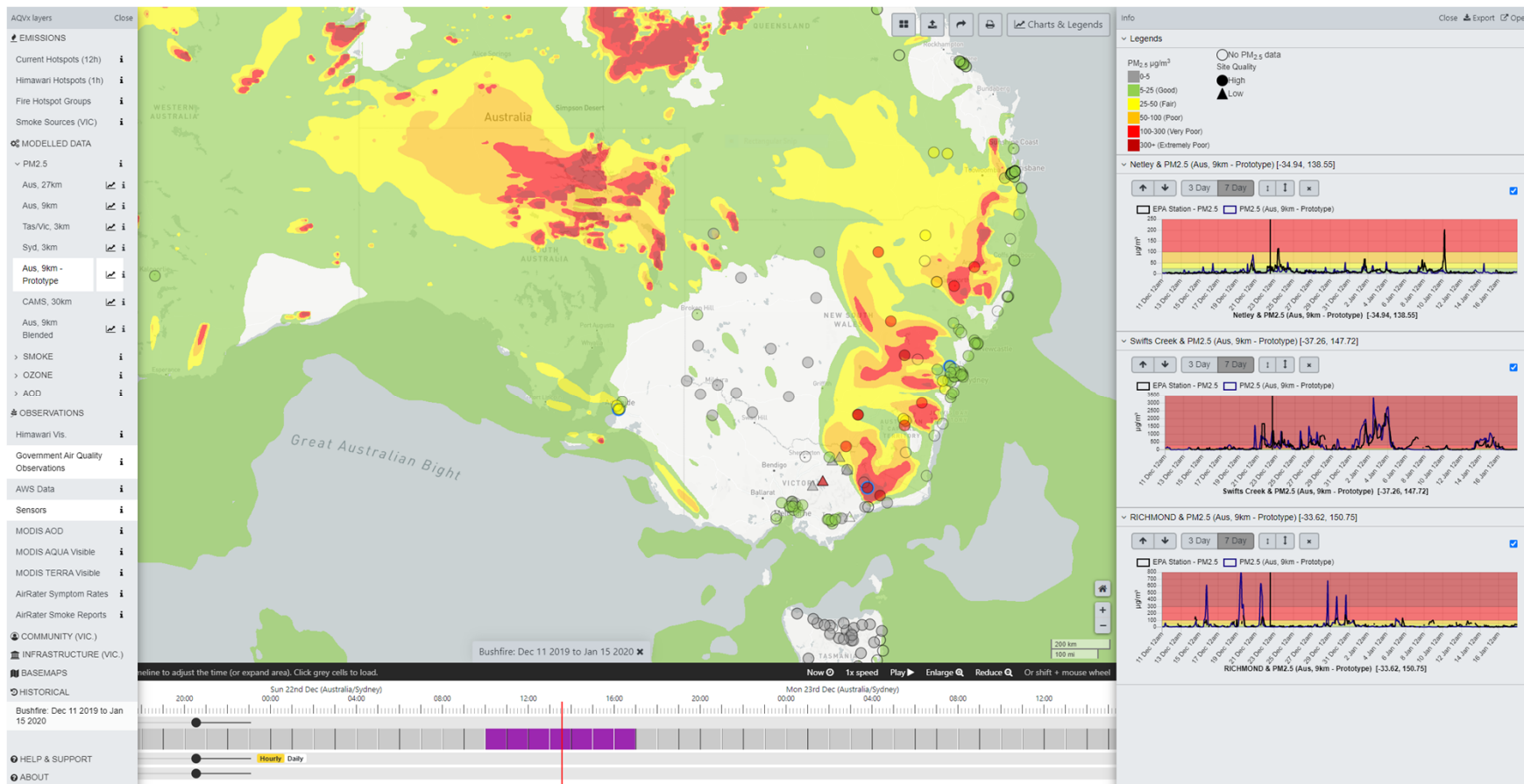# AQFx smoke forecasting project
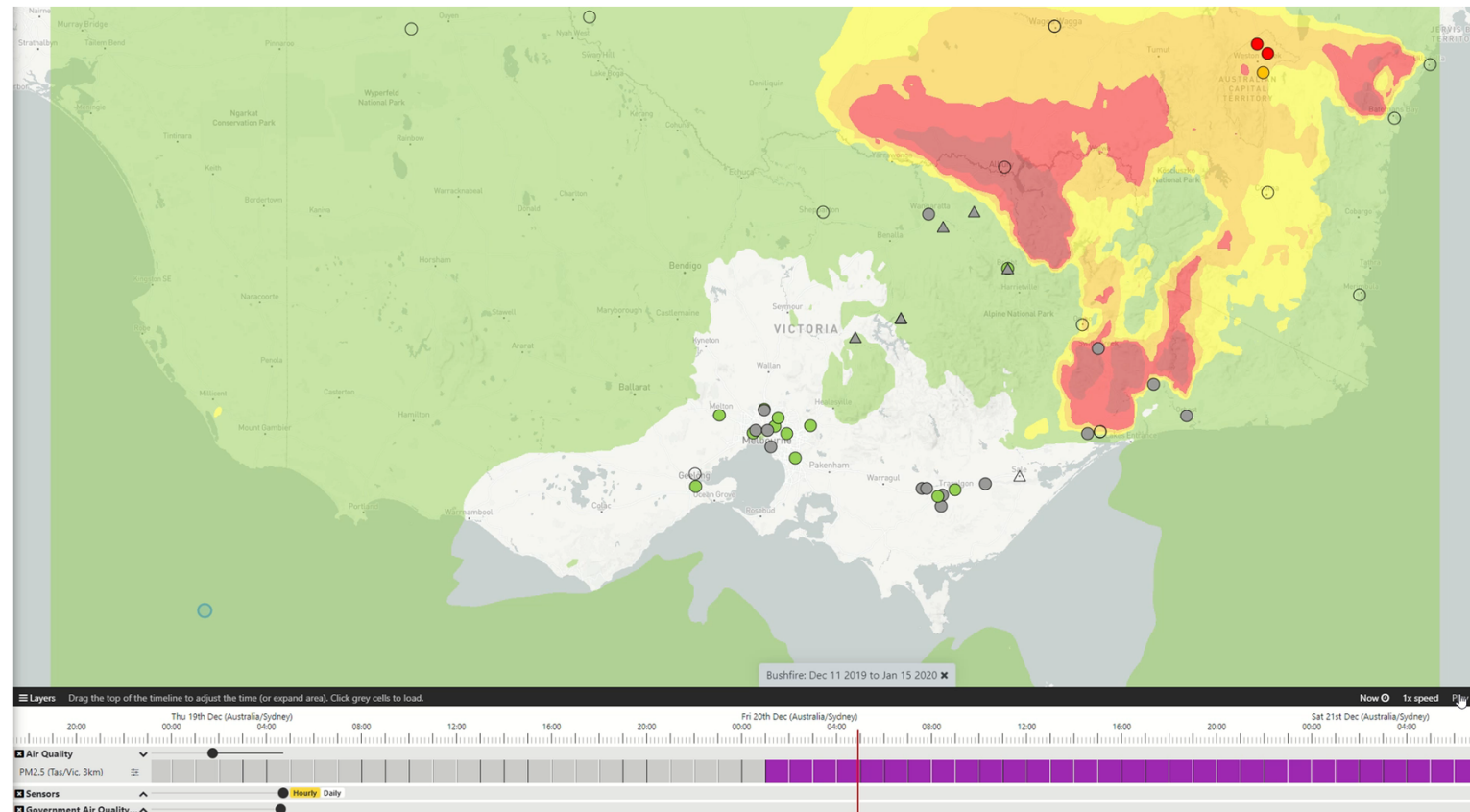
Provide forecast advisories of when smoke will impact communities

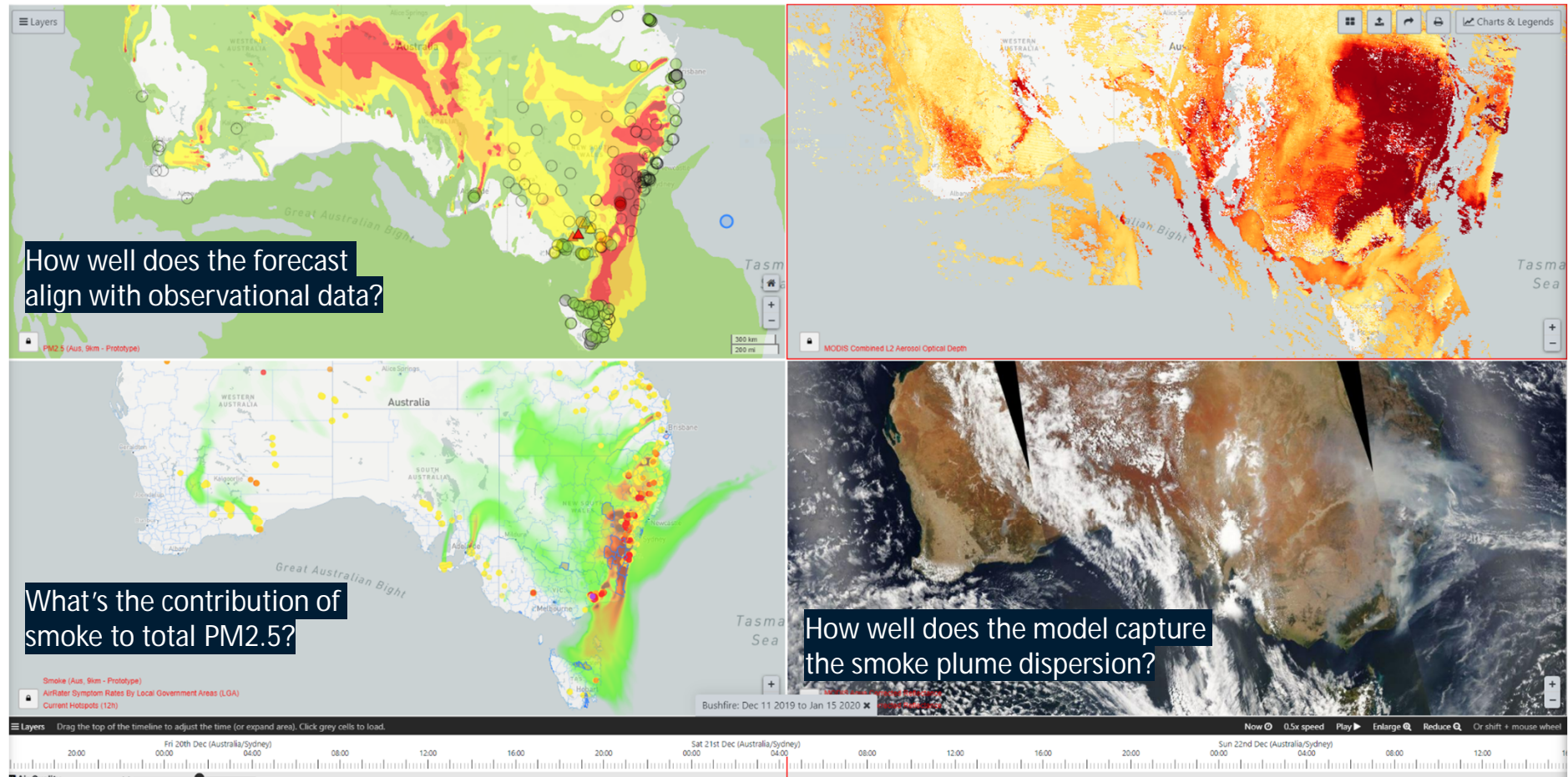Enable preventative actions
Better planning for burn-offs

Reduce population health risk from smoke exposure
Minimise agricultural impacts
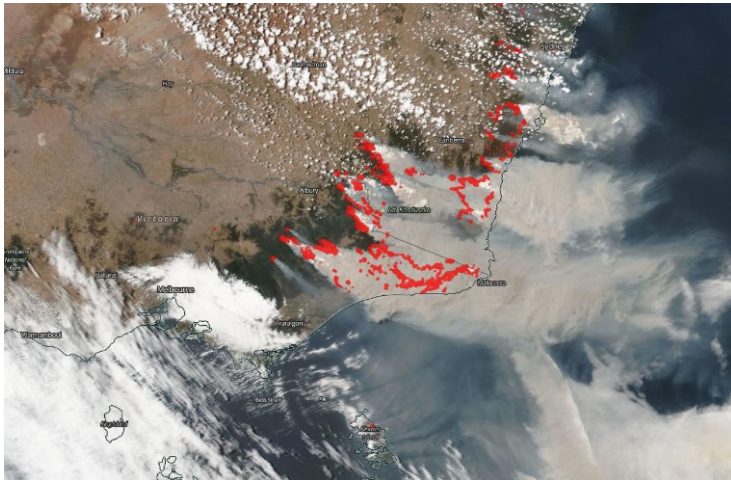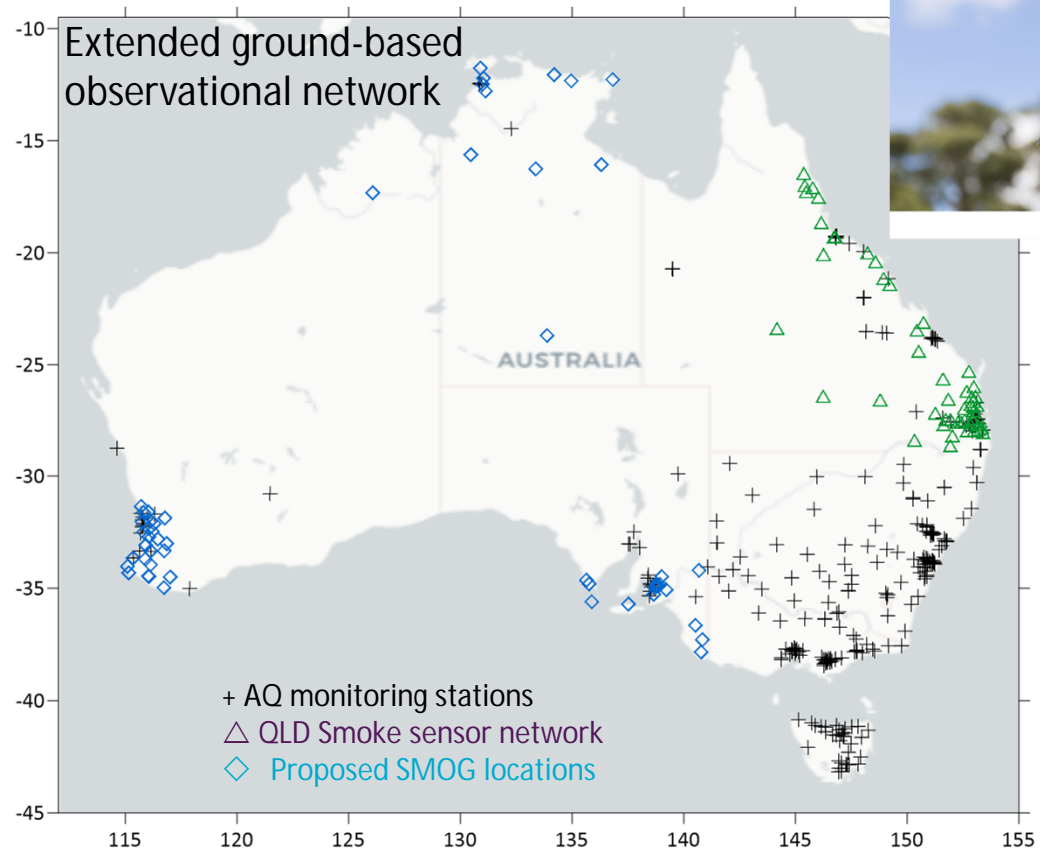
AQVx visualisation platform

Multi-panel visualisation

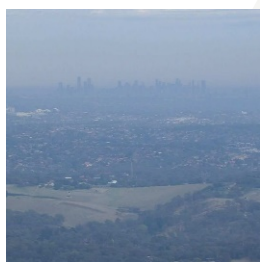How well does the forecast align with observational data?

What's the contribution of smoke to total PM2.5?

How well does the model capture the smoke plume dispersion?

Observational network for situational awareness

Satellite data

Extended ground-based observational network

+ AQ monitoring stations
△ QLD Smoke sensor network
◇ Proposed SMOG locations

AQFx - a tactical tool to aid decision-making

Forecast products
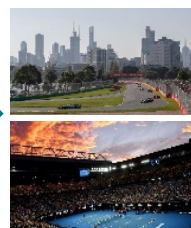
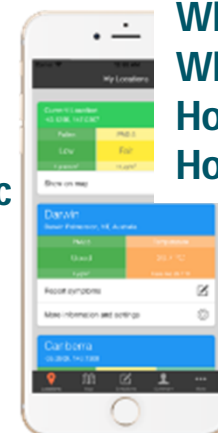HEALTH → Impacts on public outdoor events

Where?
When?
How long?
How intense?

VISIBILITY → Impact on transport sector

VITICULTURE → Likelihood of wine grape smoke taint risk

CSIRO

Virtual situation room
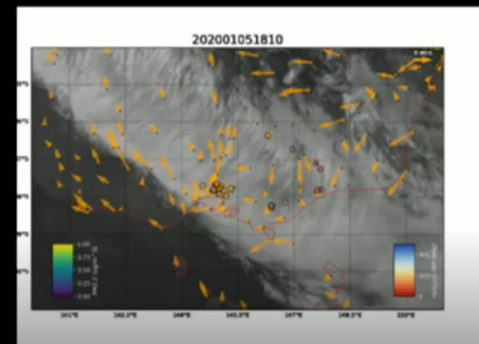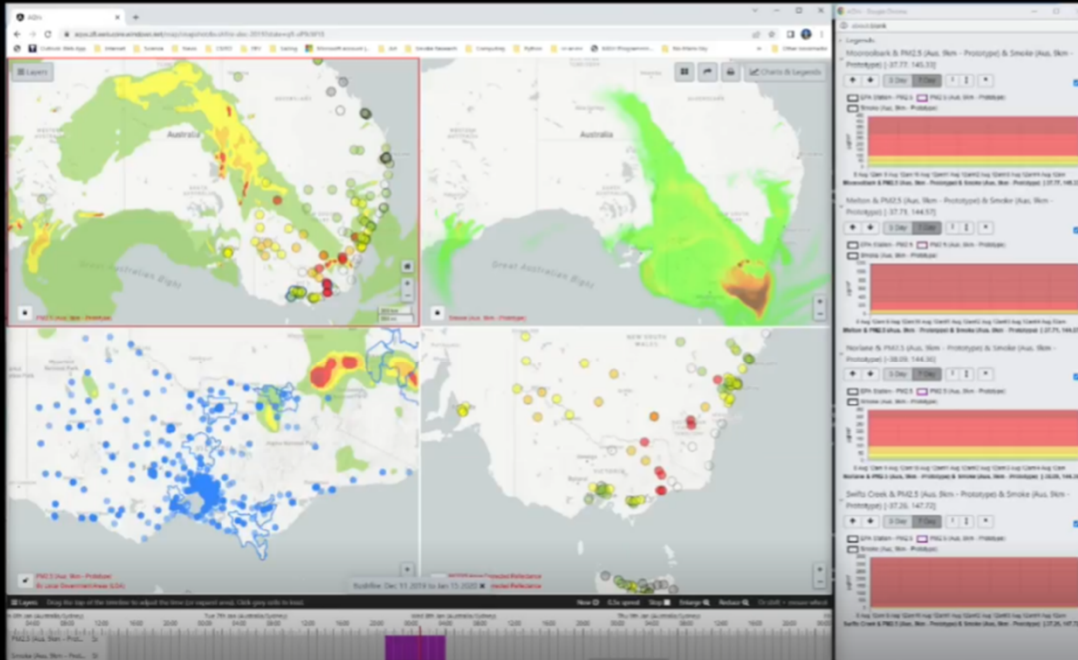
Cloud-based communication for smoke assessment

Hololens-2 Augmented reality

HoloSmoke - Bushfire Smoke Visualisation ● IBBI

VR Sandbox
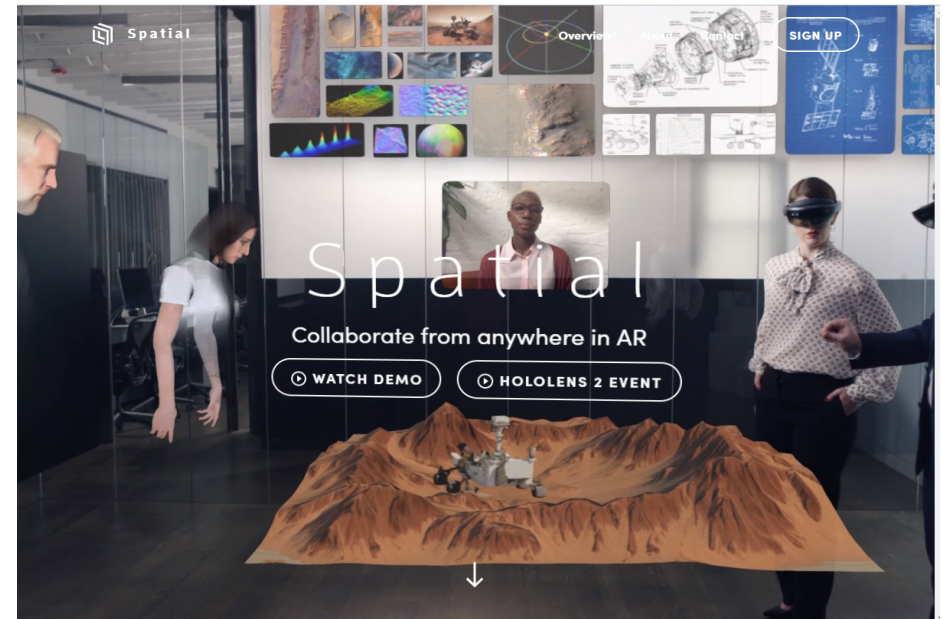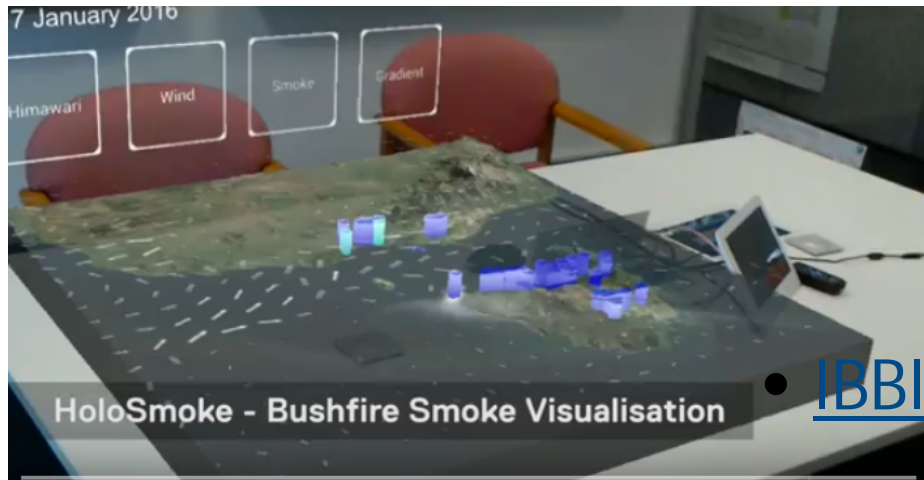
Remote meetings using avatars
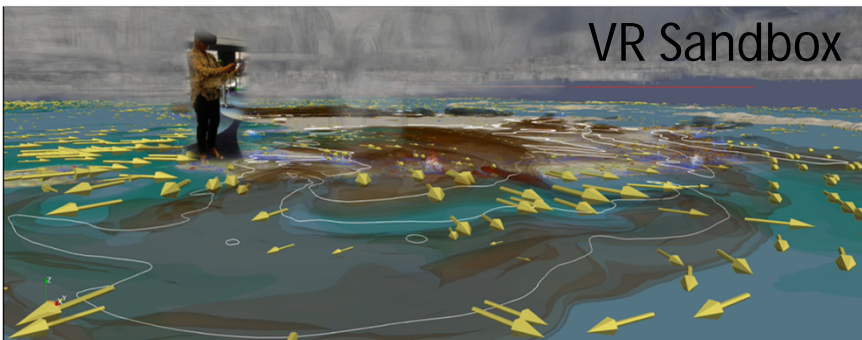
Rapid prototyping using generic open-source software

The open-source [ParaView](#) package can be used to rapidly configure and test 3-d visualisations for displaying smoke forecast information.

Challenge

- ParaView is not optimised for real-time animation of detailed scenes

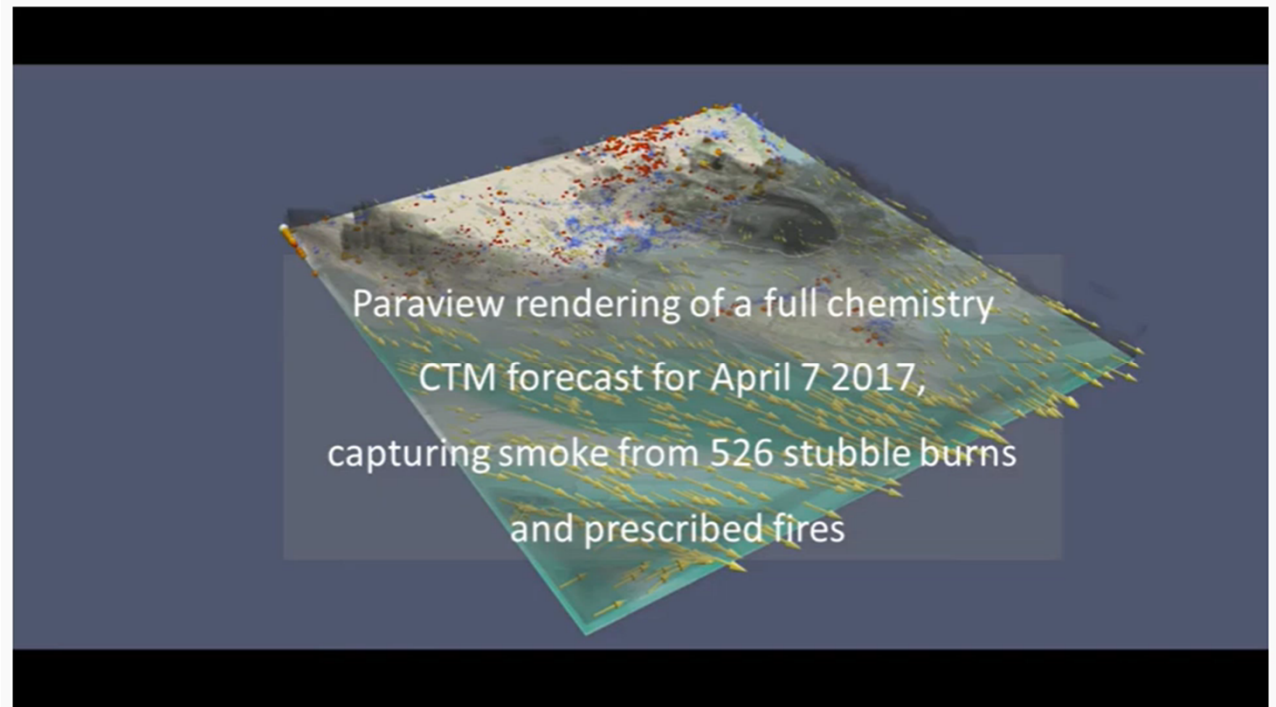Paraview rendering of a full chemistry CTM forecast for April 7 2017, capturing smoke from 526 stubble burns and prescribed fires

AR design using HoloLens 2

The HoloSmoke Project
- smoke plume transport (2D scalar grids over 16 levels)
- wind directions (gridded observations at ground level)
- weather station beacons (point sources of scalar data)
- Himawari 8 satellite imagery overlay

Moving to an integrated cloud-based AR system

- We have begun to explore the use of HoloLens 2 (HL2) and Microsoft Mesh.

- The goal is to use the HL2, take our exploratory works and merge them together, so that the most useful information can be shared across all sites via a mixed reality platform.

- On the right we show an example of the HL2 port of the HoloSmoke software.

https://www.youtube.com/watch?v=bhgfEiVgy3o
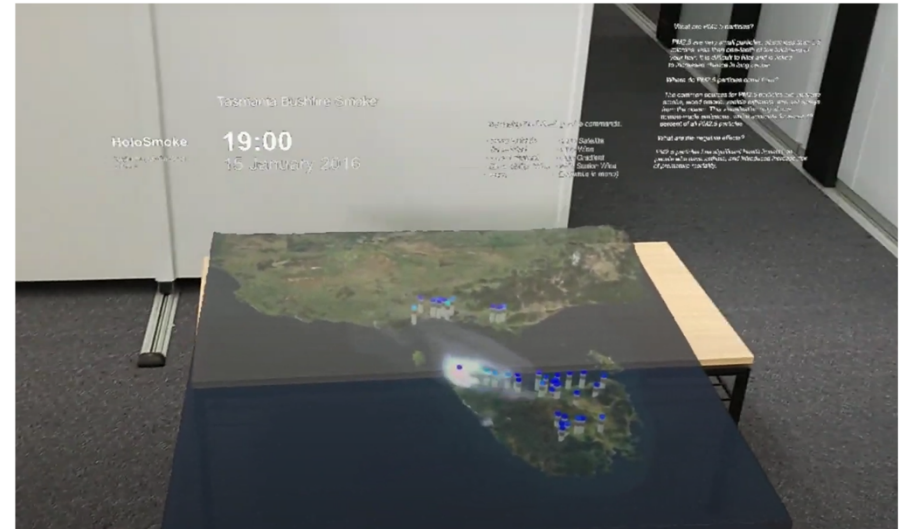
Thank you

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