



National Bushfire Intelligence Capability

Preparing Australia for a changing climate by connecting local, state and national understandings of bushfire risk

Australia's climate and vegetation make it inherently prone to bushfires that put communities, ecosystems and infrastructure at risk. The human, environmental and economic impacts of bushfire are significant and Australia's exposure to high intensity bushfire is increasing rapidly with climate change. Preparing Australia for future bushfire events requires co-ordination across all levels of government, communities and the private sector.



To address these challenges, decision-makers need readily accessible local and national data that provides an estimate of bushfire hazard and risk and considers future climate over a range of timescales.

Building on decades of bushfire science excellence, the National Bushfire Intelligence Capability (NBIC) is delivering knowledge, data and mapping products at local, state and national levels.



We developed a sequence of repeatable, modular analyses (workflows) to produce national data layers for slope, fire weather, vegetation and fuel load that can be combined into measures such as local fire severity and the potential for building losses.



We use a cloud-computing environment to tackle big data.



We are implementing governance systems to support effective national data sharing and co-development of outputs.

About

[NBIC](#) was co-designed as an innovative science-policy partnership between the disaster risk reduction function of the Commonwealth Government, currently housed in the [National Emergency Management Agency](#) (NEMA), and the [Commonwealth Scientific and Industrial Research Organisation](#) (CSIRO) to provide national information products and services for bushfire hazard and risk assessment. It is currently funded by, and is a key element of, the [Australian Climate Service](#).

NBIC addresses the on-going need for science-based, readily accessible national data and analysis on bushfire hazard potential and risk. We do this through the development of bushfire severity potential mapping products and the capture of relevant lessons about infrastructure loss for application to future bushfire events.

This will enable:

- emergency managers, land-use or infrastructure planners and land managers to more effectively prepare for reasonable worst-case bushfire scenarios based on both worst-case vegetation conditions and weather conditions expected under both current and projected climate change
- the Commonwealth Government to access nationally consistent bushfire severity and spread products as valuable inputs to socio-economic and environmental planning, and investment decision-making.

Why

Each state and territory produces data and information about their local bushfire hazard and risk using a diverse range of methods, essentially providing a piece of a larger jigsaw puzzle. Using existing and new data, applications, models and understandings we support the states and territories in considering and updating their methods to bring these jigsaw pieces together and form the next generation of fire products. To achieve this we work across 3 domains:



People: A collaborative approach with state, territory and federal agencies drawing on key strengths to develop nationally consistent bushfire hazard and risk information.



Technology: A powerful cloud-based digital platform to enable the rapid co-development, testing and delivery of national extent products and associated services that support their use at all levels of scale.



Information: Building on existing data and science to provide modular workflows tailored for seasonal to long-term decision support.

Current outputs

NBIC Stage 1, established in 2021, involved setting up collaborative arrangements through the [NBIC Council](#) and designing the workflow to produce preliminary outputs. These outputs have been used in the following ways.



NBIC mapping product: [Fireline intensity](#) to inform planning and land-use zoning decisions.

Use case: Translating Queensland latest vegetation class mapping into the [Australian Fire Danger Rating System](#) (AFDRS) fuel types, and calculating the fire intensity potential these fuels for incorporation into Queensland's next generation of Land Use Planning Maps



NBIC mapping product: Fireline intensity to inform short- and long-term planning for [critical infrastructure](#).

Use case: Working with Optus to rank their at-risk infrastructure to underpin investment decisions for resilience upgrades.

Future outputs

Under NBIC Stage 2, which commenced in May 2023, extensive improvements and validation of Stage 1 outputs will evolve to a mature NBIC product suite with the improved governance arrangements to support extension of collaboration and data-sharing arrangements.



NBIC mapping product: Annual national maps of fuel types and quarterly current fuel conditions based on dynamic vegetation modelling.

Use case: Up-to-date fuel information based on the integration of remote sensing, [dynamic vegetation modelling](#), fire history and ground-truthing data to generate estimates of current fuel condition. These maps can also be used during emergencies as inputs to fire spread simulators that estimate the severity and extent of active unplanned bushfires.



NBIC mapping product: Quarterly [fireline intensity](#) using current fuel condition.

Use case: The provision of national coverage severity potential maps to underpin risk mitigation decisions relating to where the greatest hazard exist for the current fire season.

For further information

Visit our website: <https://research.csiro.au/nbic/>
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The [National Bushfire Intelligence Capability](#) is funded by the [Australian Climate Service](#), led by [CSIRO](#) and supported by the [National Emergency Management Agency](#). We take a collaborative approach to work with national, state and territory agencies.

