

## Title: **Climate Downscaling for Fire Management**

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Workshop: Climate is one of the primary drivers for fire activity and therefore an important factor for fire management. Climate information is necessary for understanding and predicting fire regimes, seasonal and inter-annual variability, and future trends in response to the greenhouse effect, which are the scientific basis for fire management planning and implementation. Great efforts have been made by the climate modeling community to develop climate downscaling techniques and generate high-resolution climate data. The data are very valuable for improving management of fuel and fire, both of which have large spatial variability. This proposed workshop will provide fire managers and researchers with an understanding of available information on climate downscaling techniques and products, illustrated with examples of applications to actual fire issues.

**Part one** (before break): climate downscaling: Go through several issues interactively with the participants, including statistical and dynamic downscaling approaches, pros and cons, available datasets, and uncertainty. The goal is to equip them with the knowledge and information to select appropriate downscaled climate data from among available sources to meet their specific needs. It also serves as a gateway for those who wish to develop their own downscaling dataset (mainly using statistical downscale approach).

- Session Introduction (15 min.): The concept of climate downscaling, available techniques, and their significance for fire management.
- Statistical downscaling (45 min.): This is a technique to obtain high-resolution climate data by using statistical tools such as regression and spatial analyses applied to historical meteorological measurements. Statistically downscaled climate has been extensively applied to seasonal fire predictions and fire impact assessment of future climate change.
- Dynamic downscaling (45 min.): This is a technique to obtain high-resolution climate data by running regional climate models with the boundary conditions provided by either climate modeling over a larger domain or from measurements. The focus of this session is to introduce the products provided by the North American Regional Climate Change Assessment Program (NORCCAP) and analytical tools.
- Comparison of the two techniques: (15 min.): The strengths and weaknesses of statistical and dynamic downscaling are compared to provide a basis for selecting the type of products needed to achieve the specific fire management goals.

**Part two** (after break): applications to fire management: To discuss important fire management issues and illustrate with examples of actual fire applications. The goal is for fire managers and researchers to have some “hands on” experience in applying climate downscaling data.

- Discussion on fire management issues (15 mins.): This will produce a list of the major issues which the fire managers are most interested in terms of climate downscaling data applications.

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- Illustration of applications examples: Will focus on four issues among those to be identified by the managers through discussion, each with 15 mins. The following are the topics, which we will prepare for the training.
  - fire season prediction,
  - extreme weather and climate,
  - fire trends under changing climate,
  - changing prescribed burning windows due to climate change,
  - change in fuel condition,
  - fire impacts.
- Wrap-up (15 mins): Final questions and answers, focusing on future data and research needs for fire management.

Length: 4 hours

Minimum Number: 10

Maximum Number: 30

Special Needs: Two tables

Costs: No additional cost