

Development and Application of Fire Danger Rating in Southeast Asia

The Problem

For the past several decades, fires and associated haze have increasingly affected the economies, health and environment of countries in Southeast Asia. For example, during the fire and haze disaster of 1997-1998, damage estimates exceeded nine billion US dollars. Fire and haze events since the disaster indicate that the problem is ongoing. Vegetation fires in the region are predominantly human caused and thus can be managed.



Burning for commercial plantation development



Burning fallow and peat for agricultural land preparation



Heavy smoke affecting communities

Challenges for Fire Management

In general, fire management is still at early stages in Southeast Asia, with most activities focussed on detection and suppression. New investments, however, are being made in the region to develop dedicated, trained and well equipped fire management organizations. Along with the new investments in resources, more objective methods are required to support decision making on fire prevention, monitoring and suppression activities. Fire danger rating systems (FDRS) provide an objective and standardized tool to evaluate and act upon changing fire danger conditions across the landscape.



Fire team training with new equipment



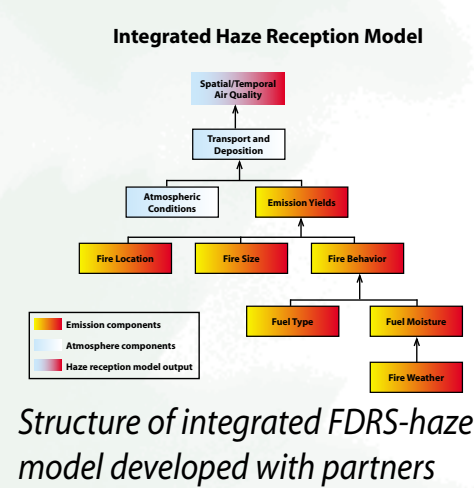
SOUTHEAST ASIA FIRE DANGER RATING SYSTEM PROJECT

A 5.5-year regional Canadian International Development Agency initiative, the FDRS project is executed by the Canadian Forest Service with partner agencies in Indonesia, Malaysia, Singapore, and Brunei and at the ASEAN level. Its purpose is to enhance the capacity of resource management organizations at regional, central and local levels to manage vegetation fires and associated haze. The project is expanding application of FDRS through four inter-related programs.

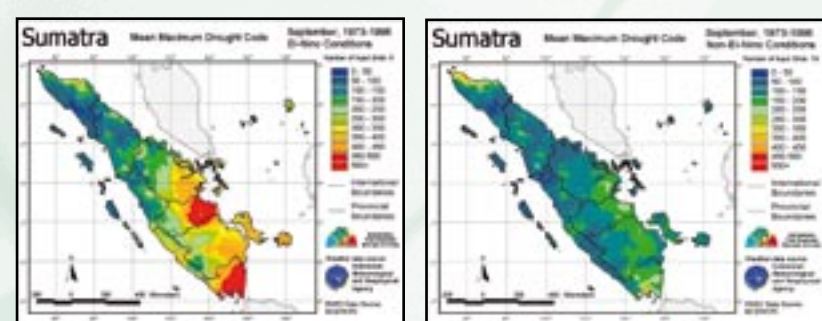
1. Adaptation to Local Conditions

Technical workshops and studies commenced with Southeast Asia partners in April 2000 to recalibrate and adjust components of the Canadian Forest Fire Danger Rating System for local conditions. Adaptation activities include, among others

- FDRS model development;
- initial adjustments;
- calibration studies (hot spot occurrence; fire weather history; fuel moisture; ignition potential); and
- fuel classification and mapping.



Structure of integrated FDRS-haze model developed with partners



Fire weather history (1973-1998) was assessed across Sumatra for El Niño and non El Niño periods to identify onset, duration and severity of potential fire conditions



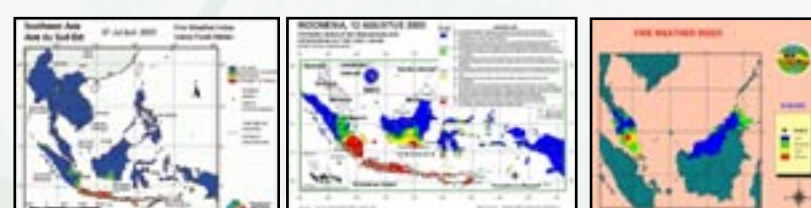
Field and lab studies to characterize local fuels

2. FDRS Operation

Technology transfer and training activities are conducted to increase competence within central and local cooperating agencies to sustainably maintain and operate their FDRS.



Manual and electronic FDRS have been established depending on user needs and resources

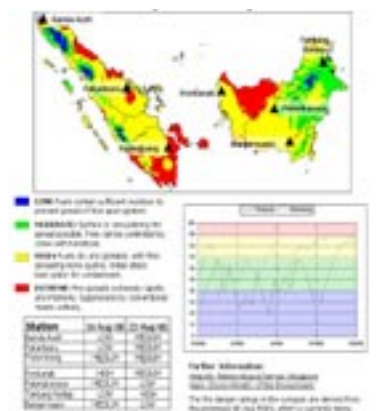


Southeast Asia agencies produce daily fire danger rating maps, which are scaled for regional, national and local users

3. Practical Applications for Users

Education and demonstration projects are being implemented to increase capacity within central and local co-operating resource management agencies to understand and develop actions based on outputs of FDRS. Technical workshops and training courses are held with partners at regional, national and local levels to

- strengthen human resources;
- ensure appropriate hardware and software are in place for FDRS operations; and
- demonstrate fire danger rating applications that strengthen existing fire prevention, monitoring and mitigation activities.



Sample synopsis used for provincial level with fire danger forecast



FDRS application training for fire management agencies

4. Regional Fire Systems

Collaboration among partners in Southeast Asia is focussed on strengthening technical development, coordination, management and integration of fire systems in the region. A key activity was to support the creation in 2000 of the Southeast Asia Fire Science Network, which includes over 30 fire scientists from six countries. The goals of the Network are to

- strengthen capacity in fire science through scientific collaboration;
- provide common positions on scientific issues, needs and research priorities;
- optimize local resources through information exchange;
- serve as a potent force in influencing policy decisions and programs related to forest fire management in the region; and
- promote increased resources for fire research.



Capacity building in fire science at local universities



Regional workshops for partners to exchange experience on FDRS

Sustained Use of Danger Rating

- FDRS calibration is now adequate at regional and national levels in Southeast Asia. Accuracy will be improved with further studies of local fuels, weather and fire behavior. The Fire Science Network is ideally suited to coordinate and perform further calibration activities.
- FDRS operations are under way and can be strengthened with tailored outputs and faster dissemination to users. A regional fire and haze monitoring centre, which is being contemplated, could coordinate further operational activities.
- Ongoing investments in fire management resources will dictate the need for better decision making. As a result, demand for FDRS may be more effective coming from self regulation (planning) than from enforcement, or prescriptive measures.



Preparing fire danger information for distribution to user agencies

Conclusions

- More comprehensive FDRS in the region are necessary to support the increasing investments in fire management programs and resources.
- The Canadian Forest Fire Danger Rating System has been calibrated to accurately forecast potential fire conditions in Southeast Asia.
- Six regional, national and local agencies in Indonesia, Malaysia and ASEAN are now producing, disseminating and acting on daily fire danger rating information.
- A key challenge is to balance the need for improved early warning information with careful introduction at local levels to the concepts of integrated fire management, which include anticipatory approaches.

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