Den Wind erkennen
Knowing which way the wind is blowing
Entendemos el viento

Simulation of Forest Fire Propagation with FireStation and WindStation

FireStation is a software for the simulation of forest fire spread in complex terrain. The software is distributed by the portuguese research center ADAI (Association for the Development of Industrial Aerodynamics). By linking FireStation and the CFD-Software **WindStation** of menzio GmbH, powerful fire propagation predictions are simulated. The results are used for fire risk management by local authorities, to provide operational real time prognosis for effective management of fire fighting especially for forest owners and paper producers.

Input Data
- Digital elevation model
- Vegetation and moisture maps
- fuel properties (particle size, fuel load, fuel depth as moisture contents)
- Wind speed and direction simulated by **WindStation**

Model Physics
- Rothermel's model (propagation speed)
- Ellipse type models (fire shape)
- Dijkstra's algorithm (fire growth)

Results
- Propagation map (Figure 1)
- Flame length
- Heat release rate
- Fire spread rate
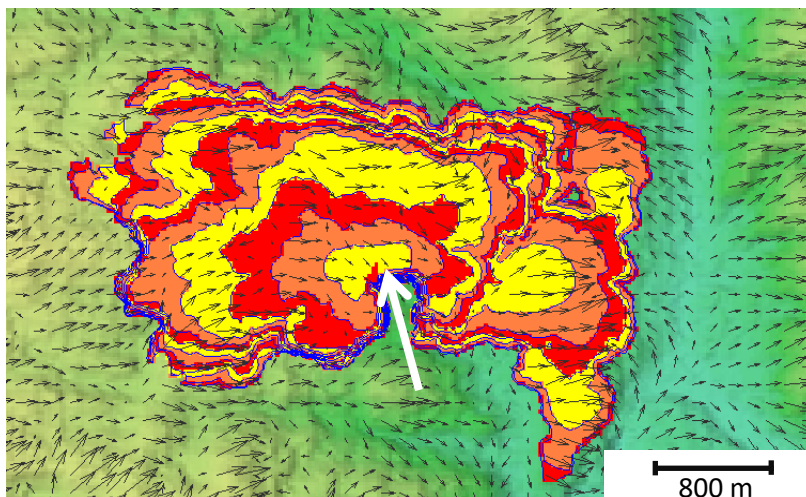- Fire line and depth intensity

800 m

Figure 1: Results of a fire propagation simulation with **FireStation.** The black arrows show the direction of the wind field simulated with **WindStation.** The different colors visualise the fire propagation within one hour. A large area indicates, that the fire was propagating rapidly. The source of the fire is indicated by the white arrow (Picture rights: ADAI).