HOW TO MODEL A WILDFIRE

INPUTS USED:

Weather data:	– Fire Weather Forecasts – Fire Weather Briefing – Registered user Pages – Radar – AWS data – Visual, IR & Water Vapour SatPix – Aerological Diagrams
Field data:	– Air & Field Observers – Ops Notes – Deployed AWS – Linescans – Current watch–outs – Current Red Flags
Spatial data:	– Fuel state – Assets – Terrain analyses: elevation, slope, aspect, MSER, ruggedness, channelling.

FLOWCHART A

FIRE DANGER RATING

FIRE SCALE	Low to Very High	Severe or Extreme	Cata–strophic
Small, Medium	Local	Local	IMT + FC B
Large, Very Large	IMT	IMT + FC B	FC C
Extreme	N/A	IMT + FC C	FC C

Where:
Local = *Ops* will handle fire behaviour based on the Fire Weather Forecast and the initial SitRep.
IMT = Fire Behaviour modelling will be carried out as soon as operational procedures dictate that a Type 2 or Type 3 IMT is required and a *Situation Unit* is established.
FC B = **Flowchart B** will be applied by the Situation Unit leader.
FC C = All fire behaviour modelling by the *Situation Unit capability* (unless otherwise directed) will be on the assumption of a plume–driven fire and will use **Flowchart C**.

OUTPUTS:
– Weather time sequence
– Remote sensing products used
– Fire spread forecast maps
– Fire intensity maps
– Fire type maps
– Threats map

IMPORTANT POINTS TO NOTE:
1. Follow the Protocol for Detailed Fire Weather, Fire Behaviour and Fire Risk Analysis and Prediction.

FLOWCHART B

SPECIES OF FIRE:		
Flat	Use at least one of: (A) Use a paper–based or spreadsheet model to predict a wind–driven, elliptical fire. Get ROS from suitable model. Assess lateral spread from Pasquill's Index. Predict forward spotting distance. (B) Use a computerised isochrone fire spread model to indicate where the fire might reach at future times. (C) Use the fire vector model to indicate the pattern of fire spread from its origin.	
Undulating	Here the goal is to adequately assess: 1. the uphill runs, and the potential for advance spotting 2. downhill runs, and the potential for suppression. 3. key wind / terrain interactions and the potential for erratic fire behaviour. 4. Prediction of likely arrival times at threatened assets.	Ensure at all times that weather observations have the fire within their radius of relevance. Assess potential for discontinuous fire behaviour: 1. dew point depression events 2. forced channelling events 3. abrupt surface dryings 4. low–level jets 5. foehn winds 6. wind changes 7. Thunderstorms
Rugged	As the fire has already escalated, it is likely to be difficult to predict or suppress.	Goals: 1. Model as per an undulating fire. 2. Outline extent of downwind rugged landscape and add 5 km on downwind edge. This is the threatened area. 3. Assess potential for plume–driven fire to occur based on strong convection, channelling or wind changes

FLOWCHART C

1. Check for watch–outs and Red Flags
2. Analyse Aerological Diagrams
3. Analyse landform ruggedness
4. Assess atmospheric stability
5. Assess potential for channelled fire
6. Assess potential fir wind change
7. Assess potential for fire escalation during this shift

OUTPUTS:
– Aerological Diagram(s) used
– Aerological Diagram analysis
– Assessed escalation locations
– Plume–footprint map
– Threats map

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