Moisture codes of the Canadian Forest Fire Weather Index System could be used to forecast the flammability of key moorland fuels

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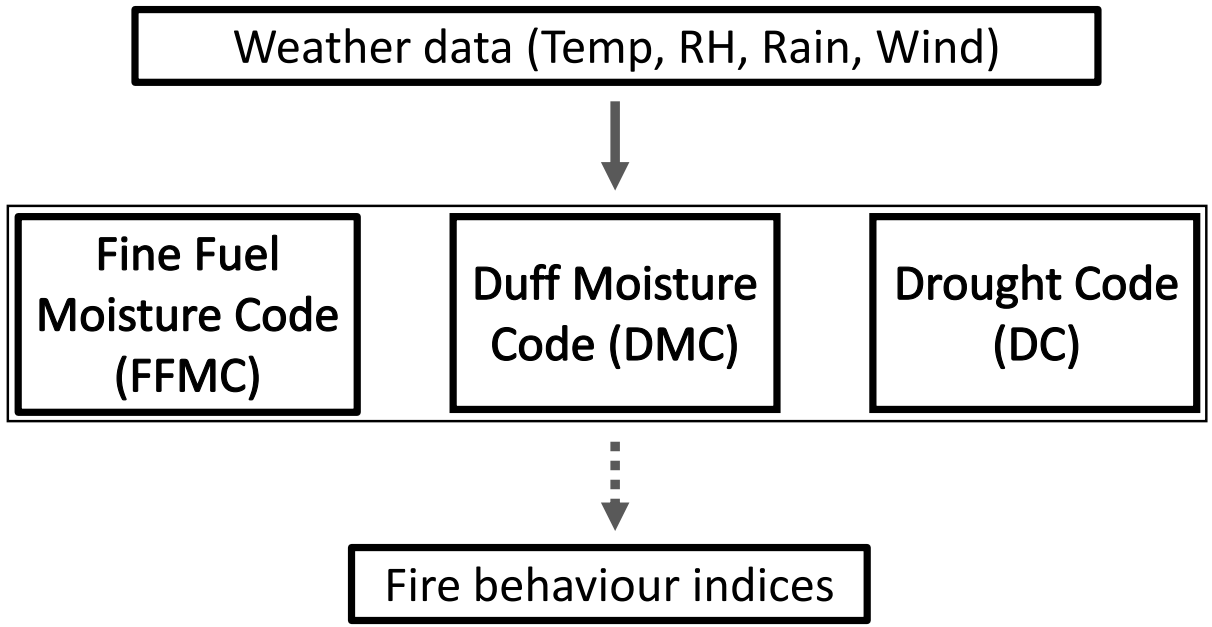
The Canadian Forest Fire Weather Index (FWI) System

- Underlies Met Office Fire Severity Index (MOFSI)
- Underlies European Forest Fire Information System (EFFIS)
- Daily weather data to estimate Fuel Moisture Content (FMC)

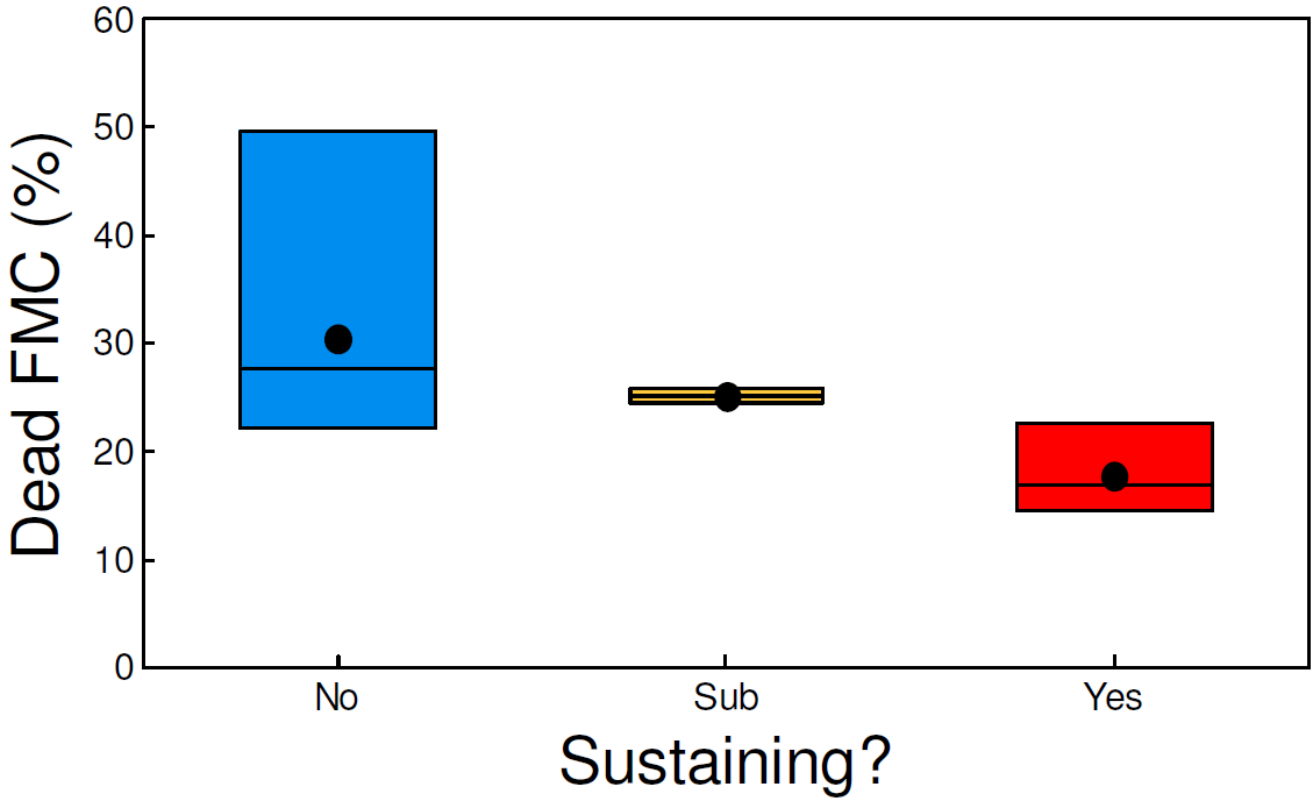


Structure of the FWI System

Fuel Moisture Content controls fire behaviour

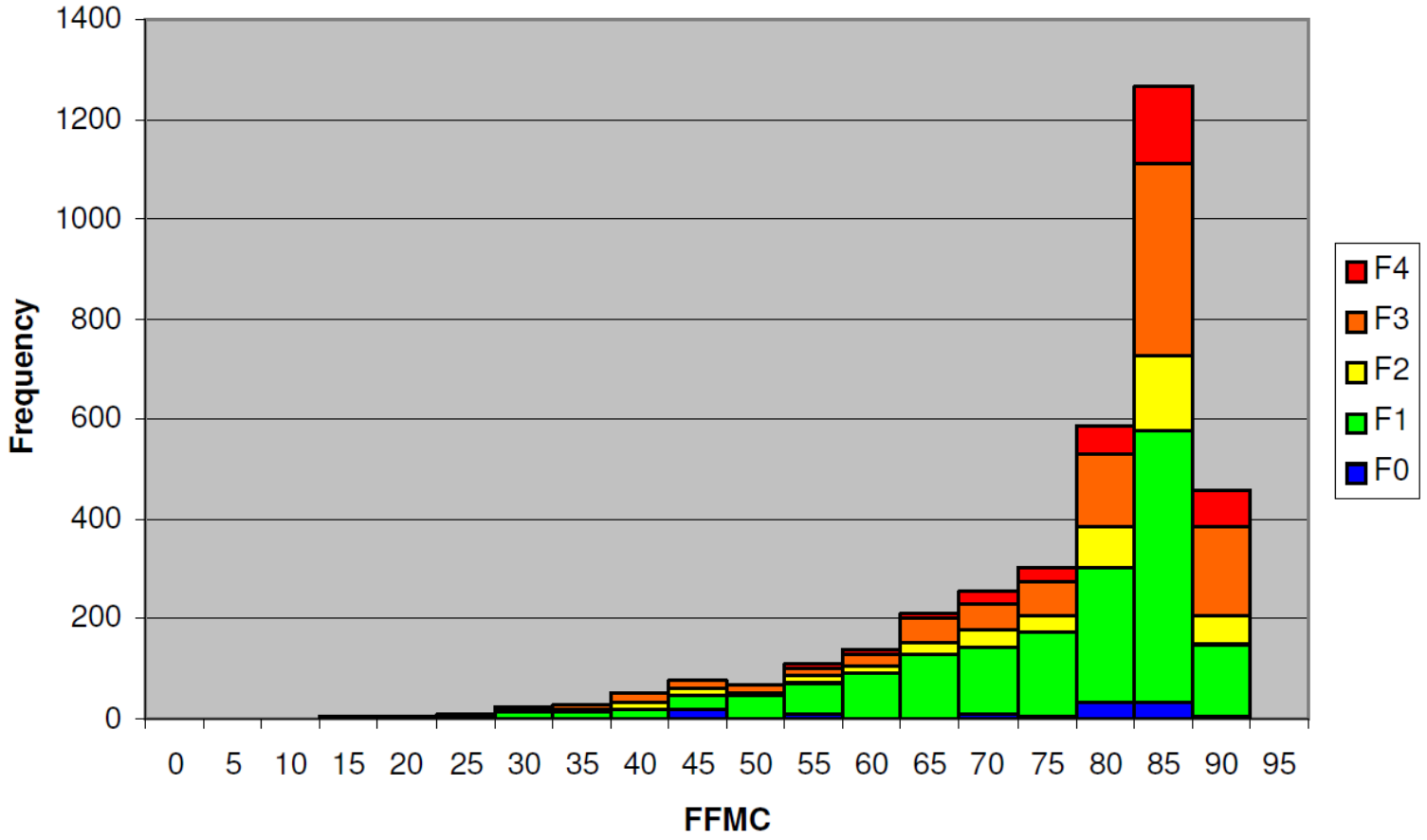
Fire behaviour	**FMC**			
	Live	Dead	Moss/litter	Peat
Ignition		X	X	
Spread	X			
Severity			X	X

Dead FMC controls fire ignition in prescribed fires



Source: FireBeaters Phase I Report (2007)

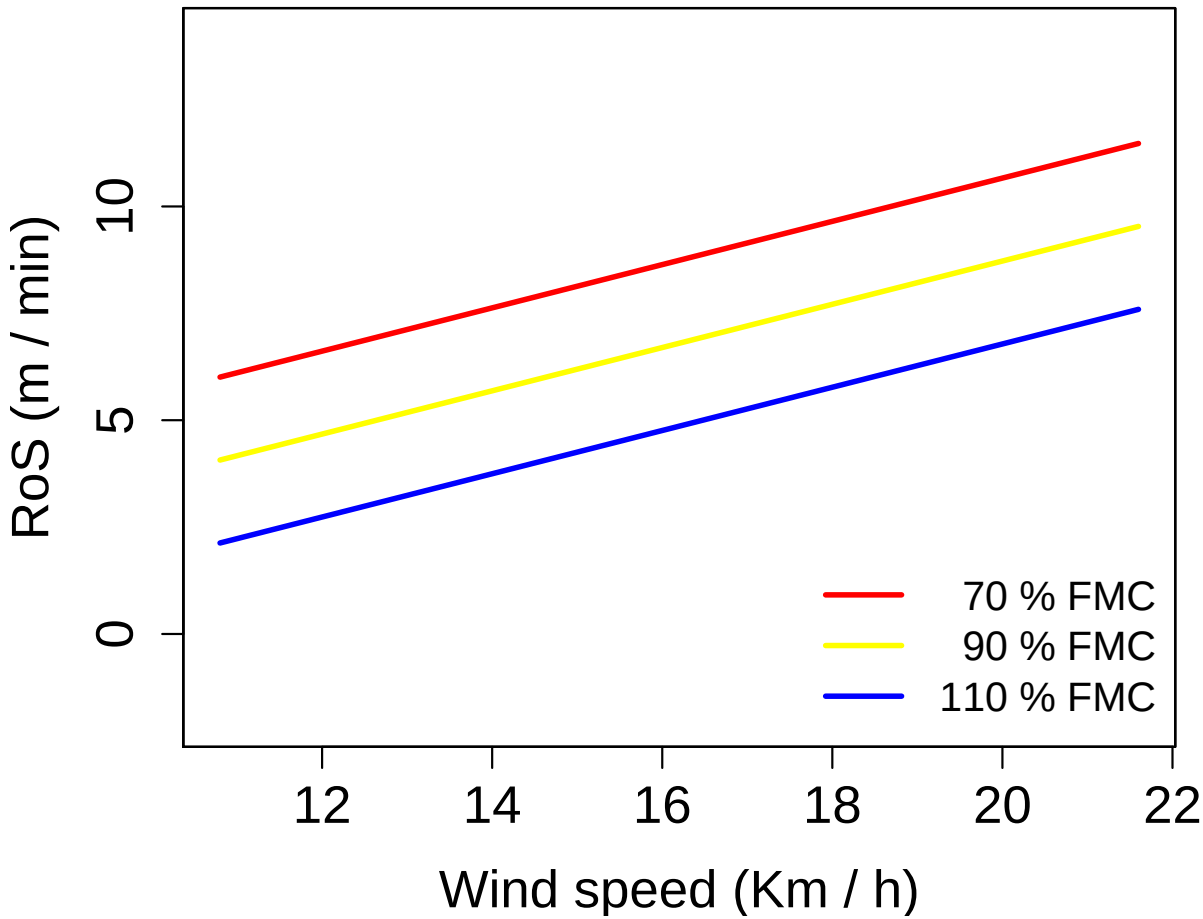
Moss/litter FMC controls fire ignition (wildfires)



Source: FireBeaters Phase I Report (2007)

Live FMC controls fire Rate of Spread

- RoS depends on wind speed, fuel load, and canopy FMC



Adapted from Davies et al. (2009)

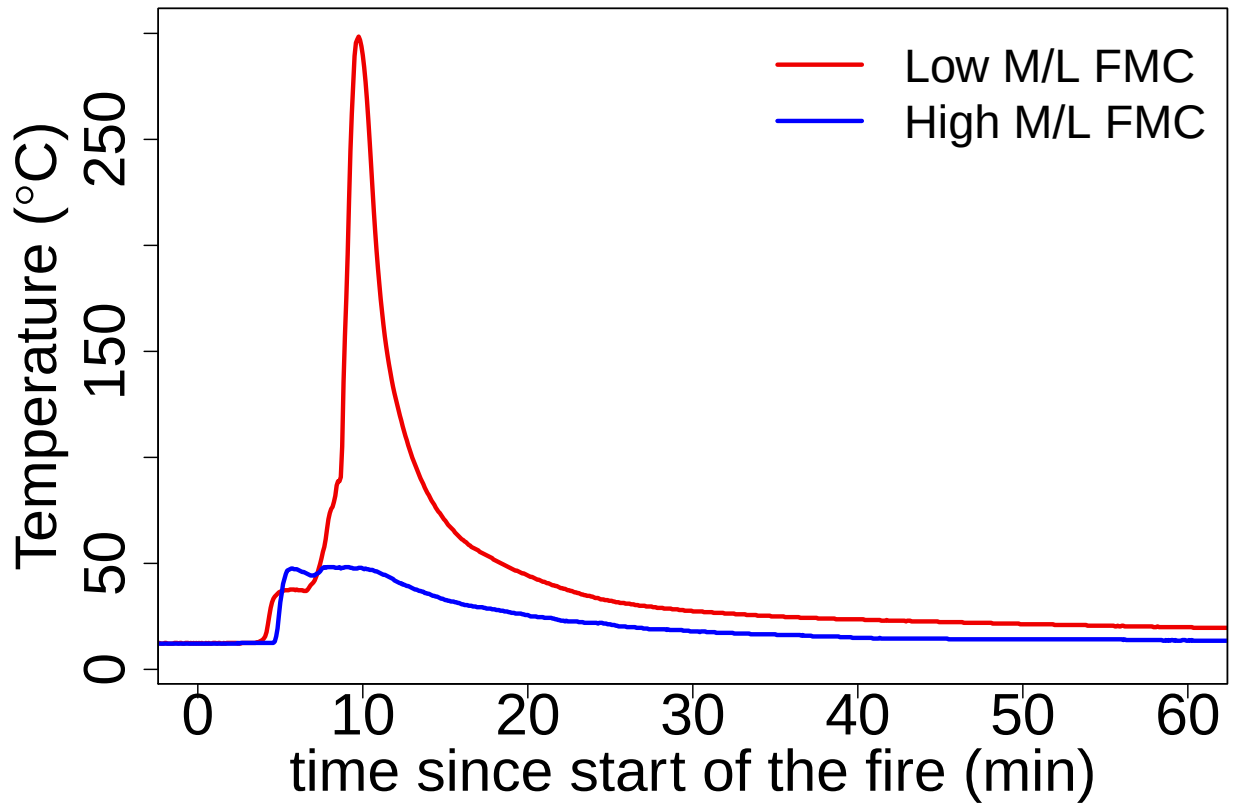
M/L layer FMC controls fire severity

- Ground fuels available for burning when FMC < 100 %

Post-fire smouldering in Braehead Moss (South Lanarkshire)

M/L layer FMC controls fire severity

- Increased fire-induced peat heating when low M/L layer FMC



Peat FMC controls fire severity

- Peat ignition possible below 125 % FMC

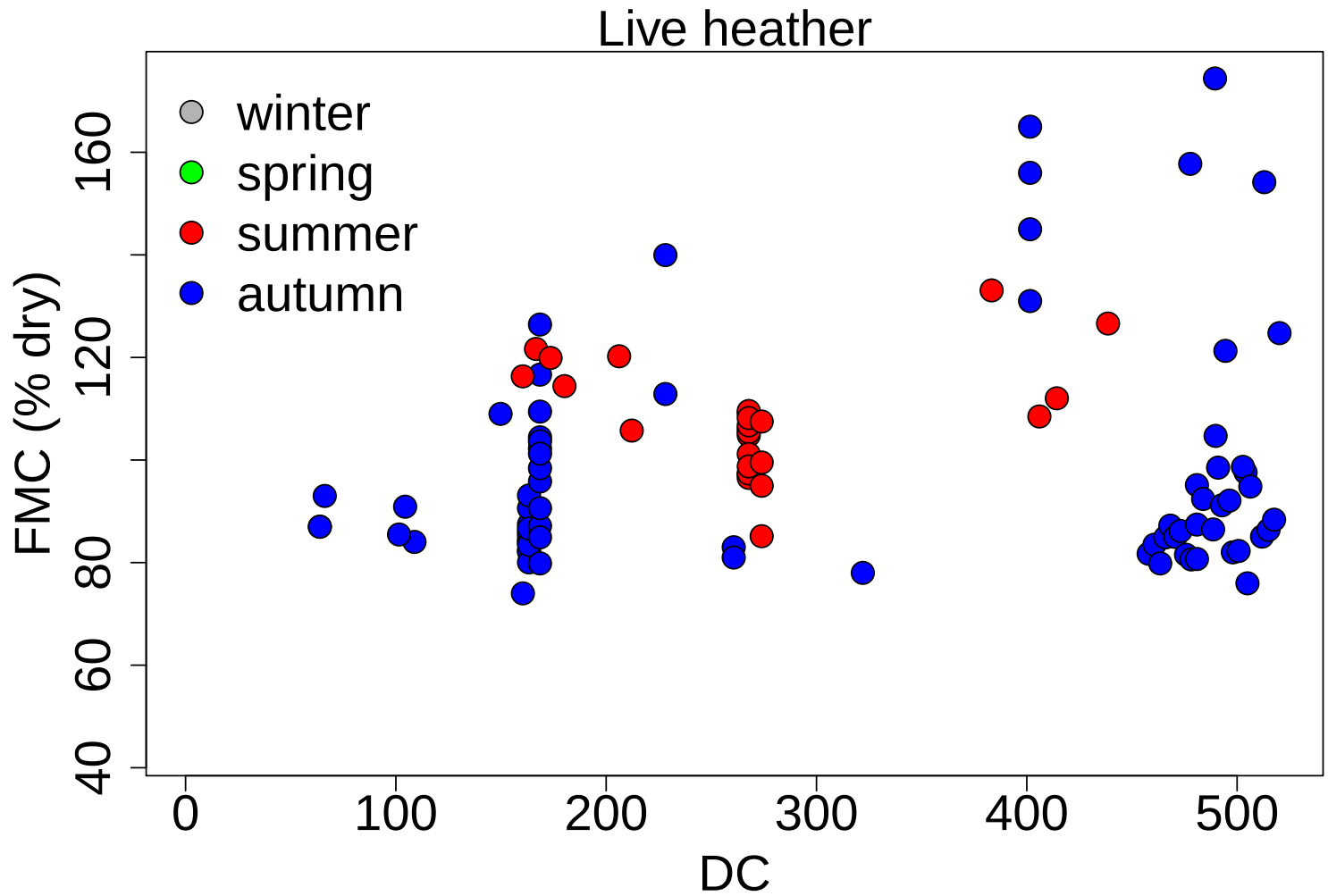
Rothiemurchus fire, July 2006, Scotland. Source: Rein et al. (2008).

Aim of the study

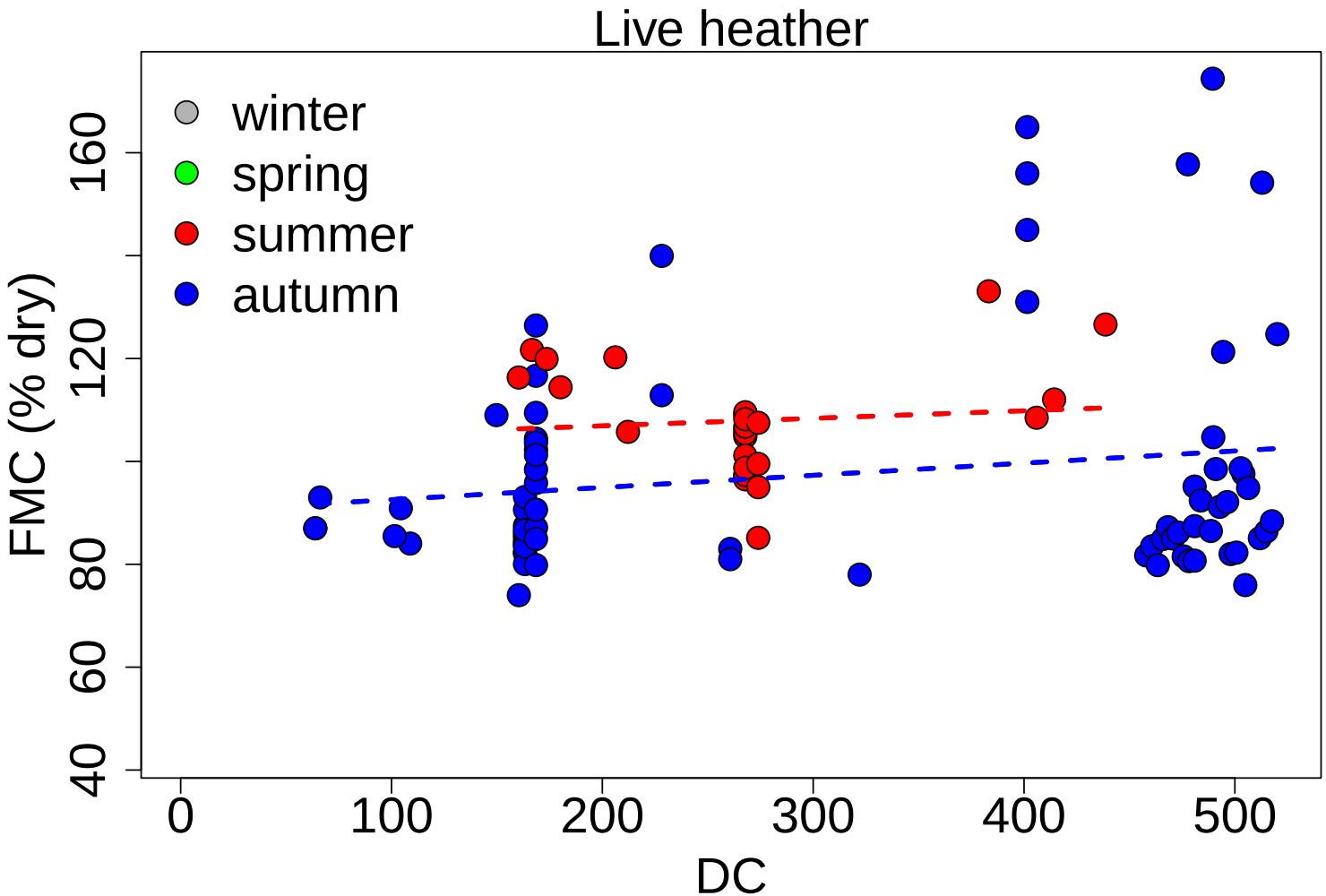
Is FWI doing a good job in estimating FMC in heather moorlands?

- Relate FWI codes to FMC heather moorland fuels
  - Live heather
  - Dead heather
  - M/L layer
  - Peat

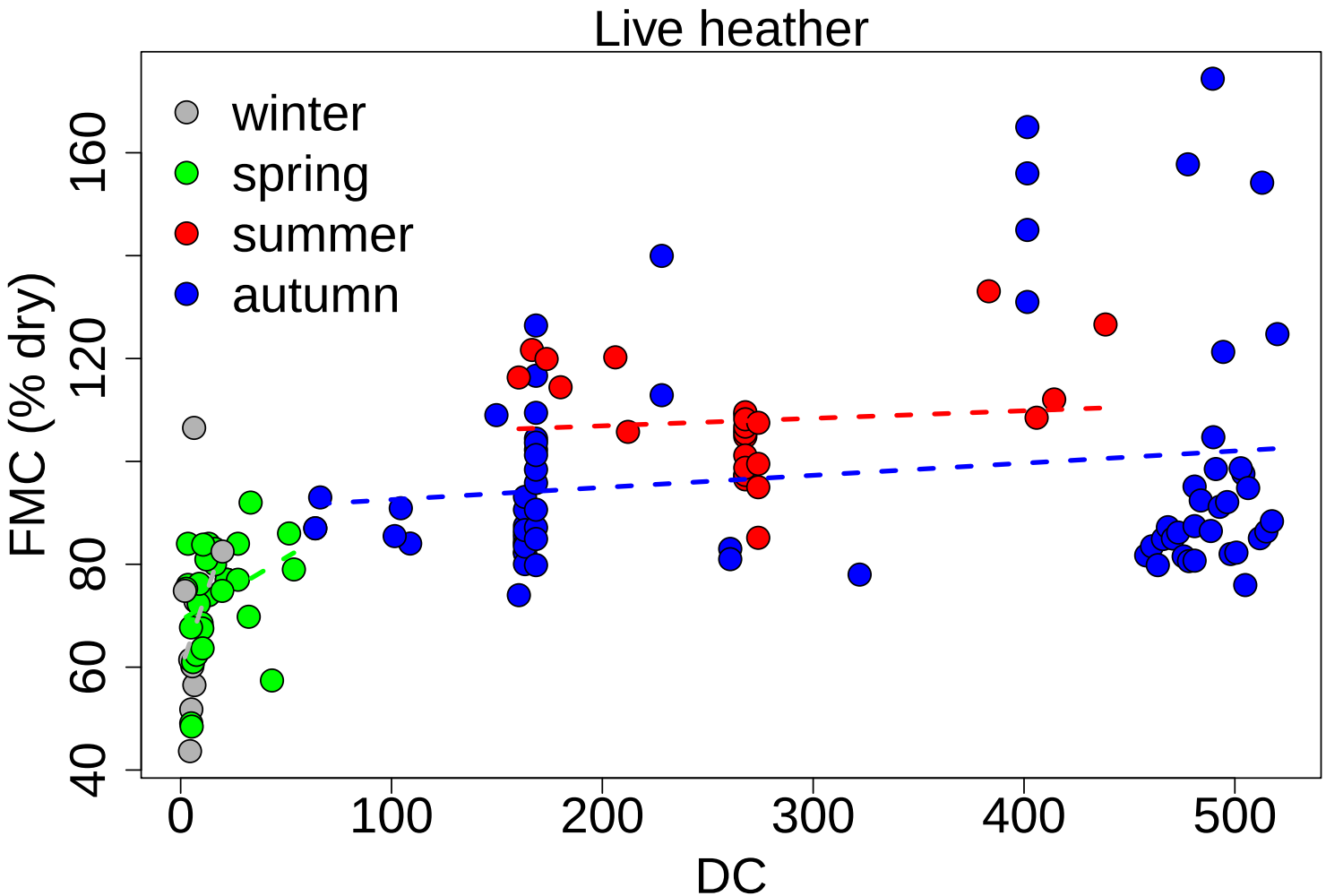
FWI codes unrelated to live FMC



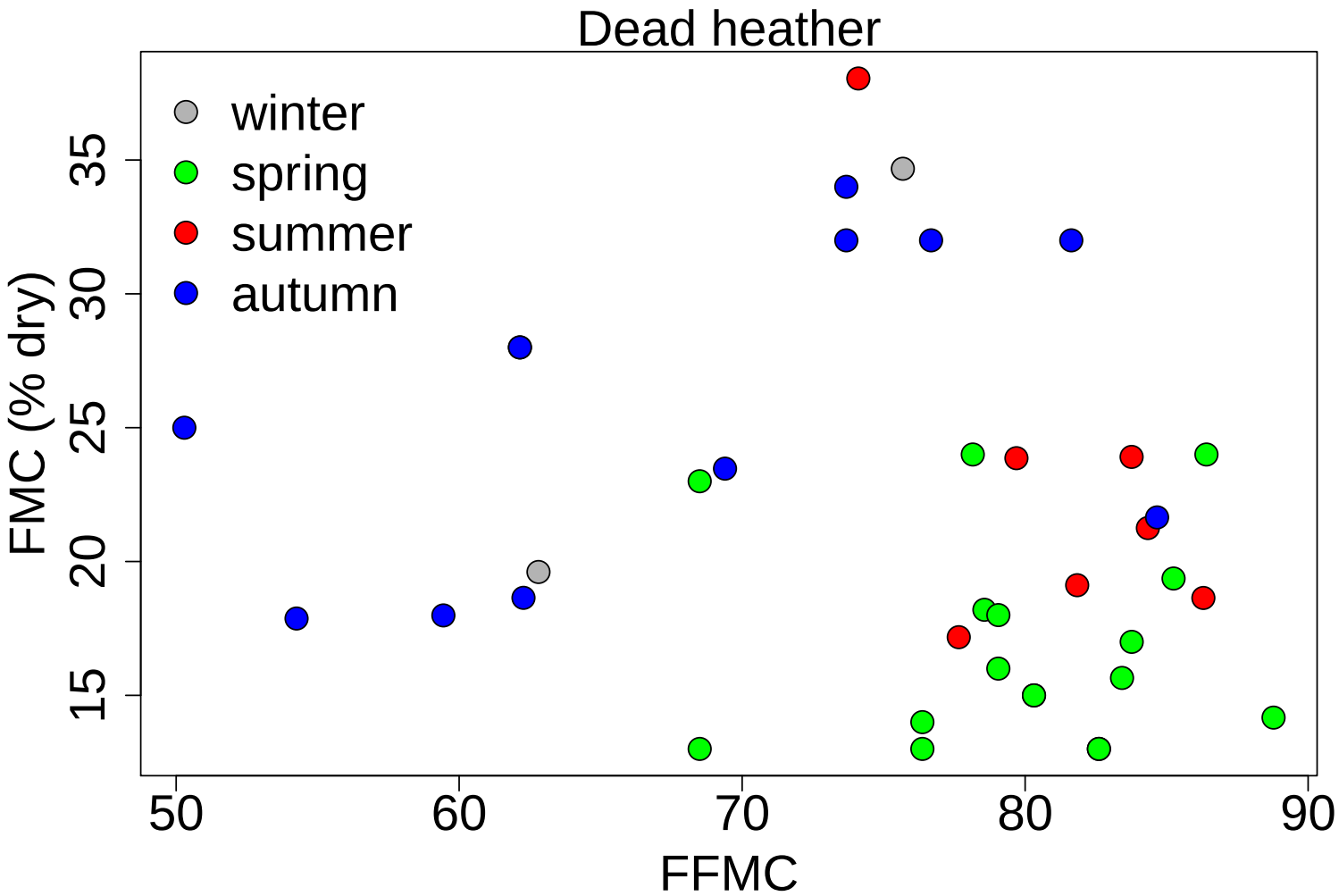
FWI codes unrelated to live FMC



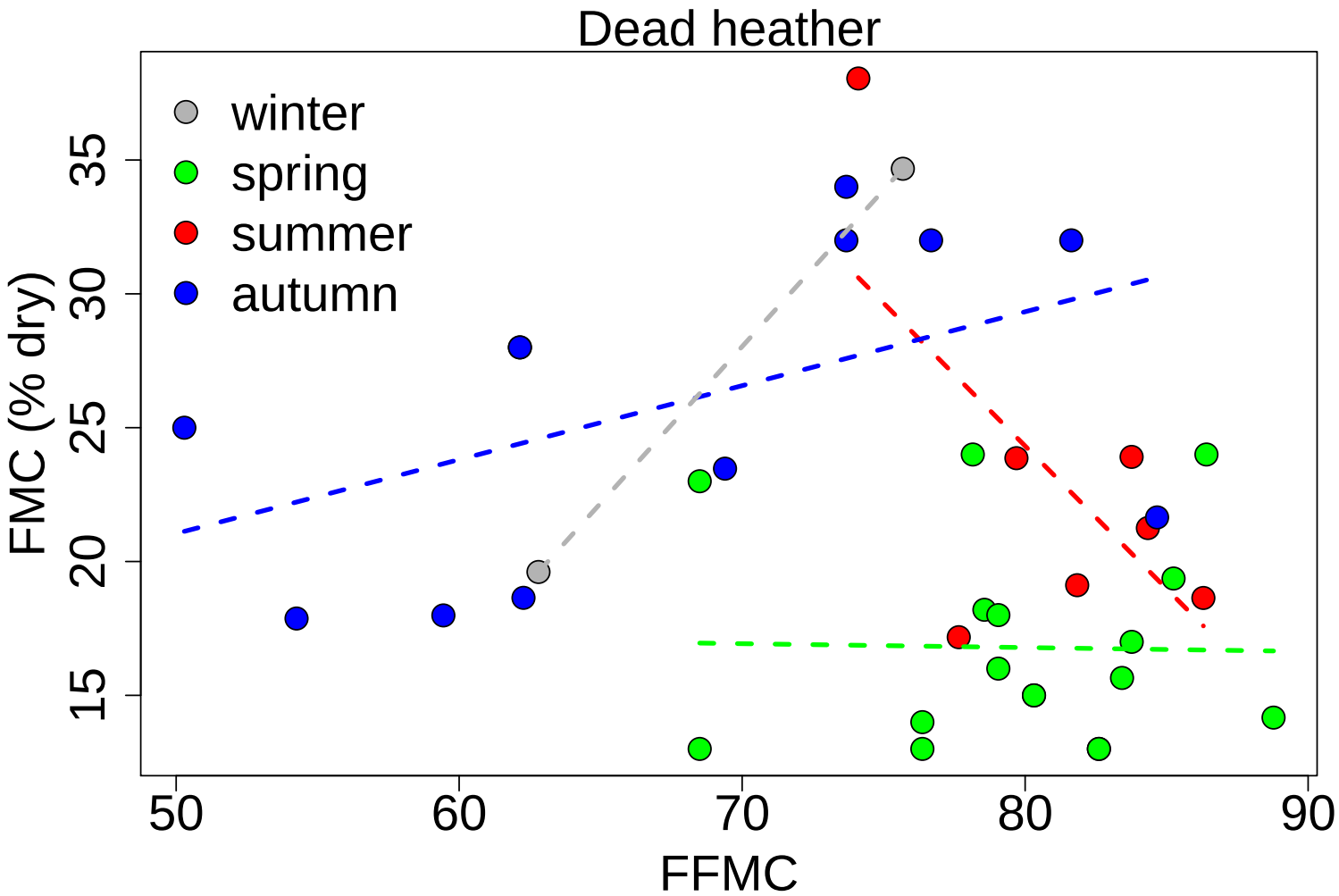
FWI codes unrelated to live FMC



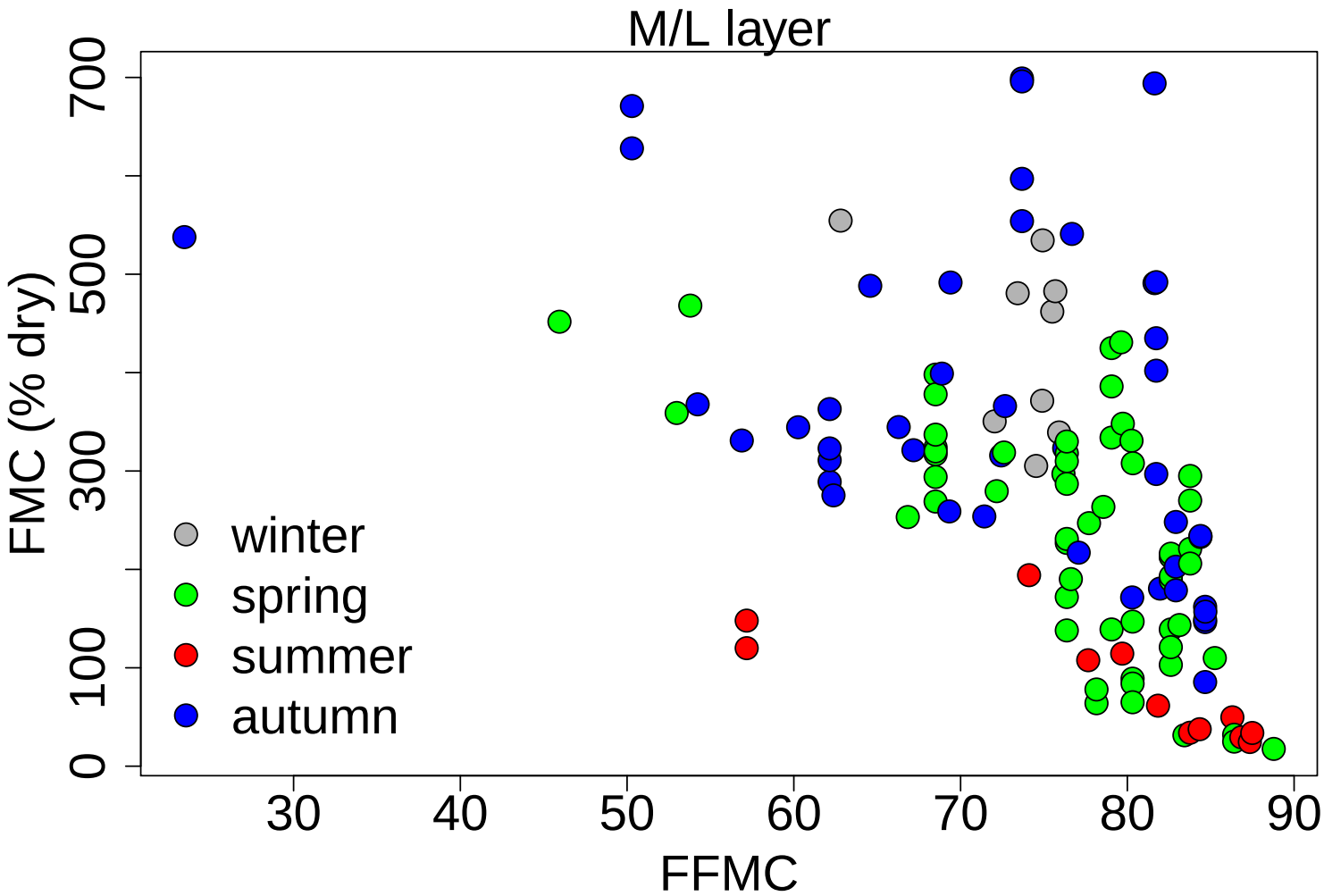
FFMC unrelated to elevated dead FMC



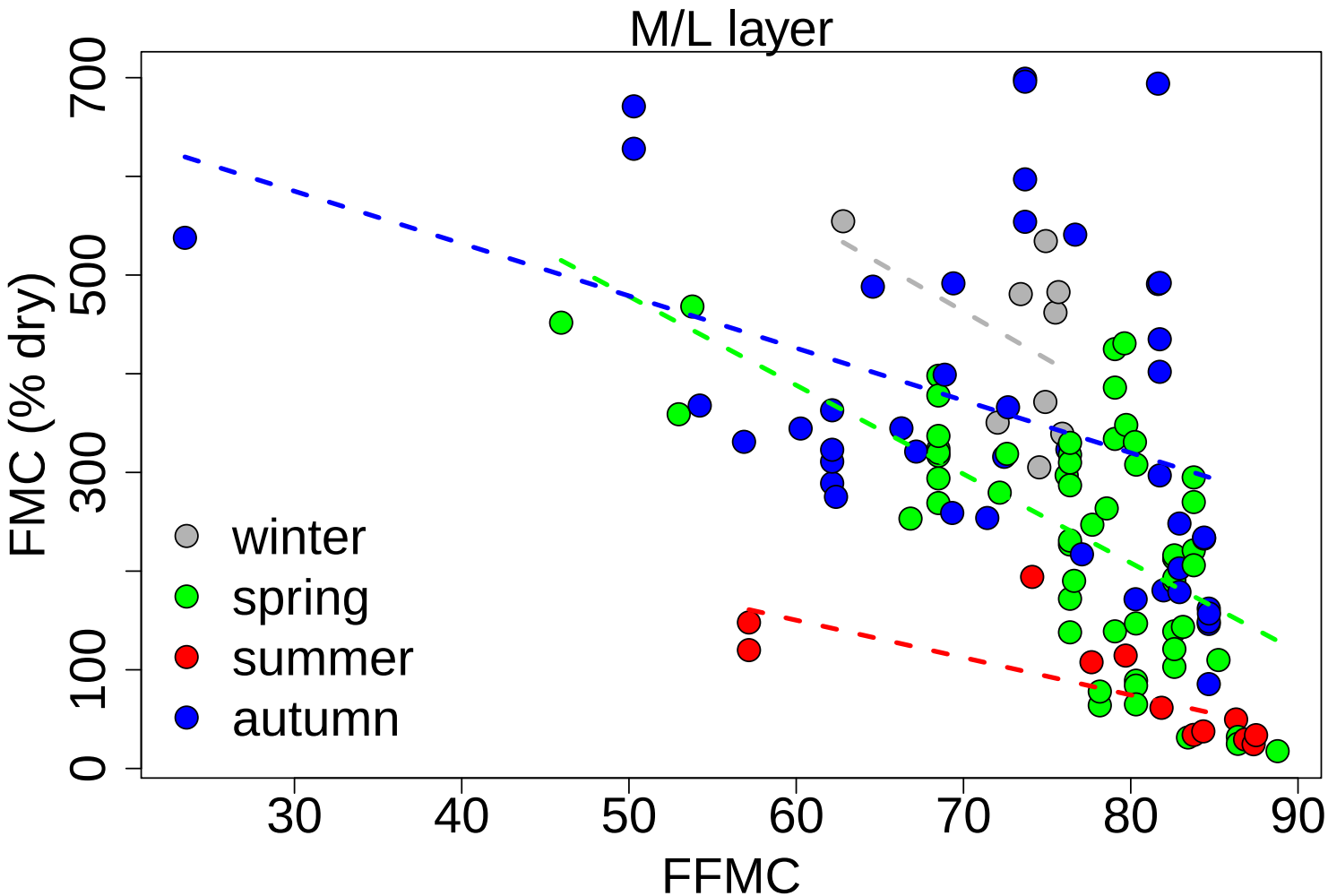
FFMC unrelated to elevated dead FMC



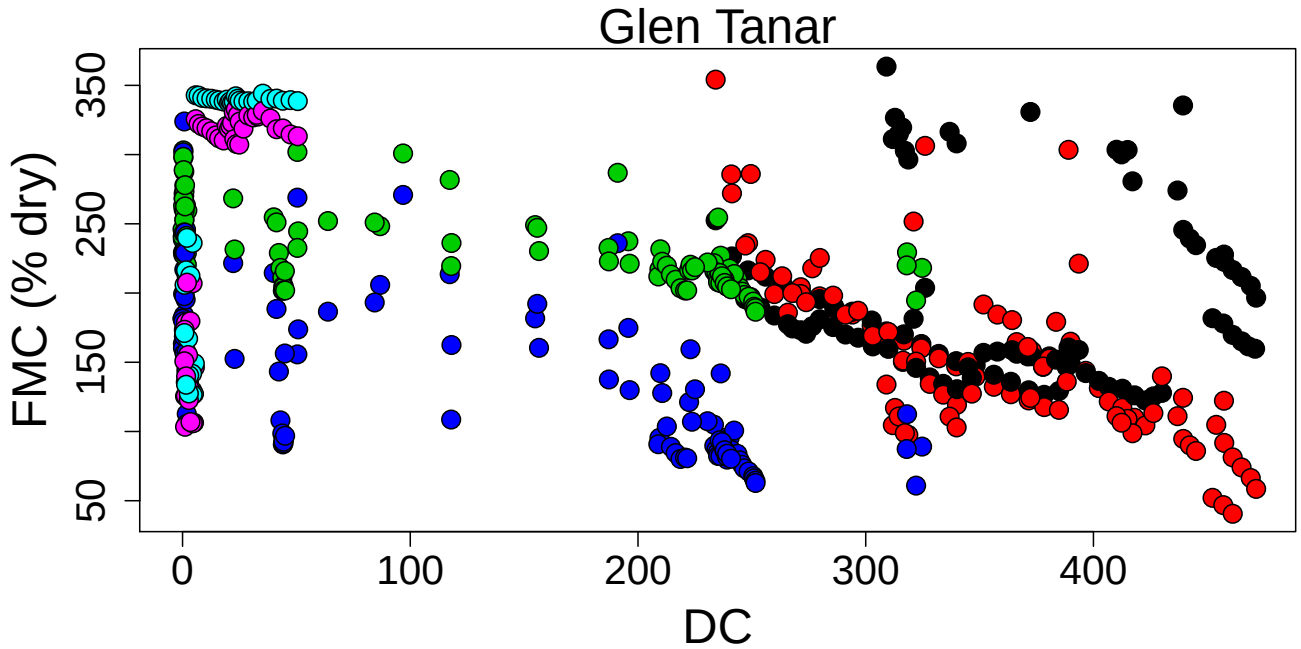
FFMC related to M/L layer FMC



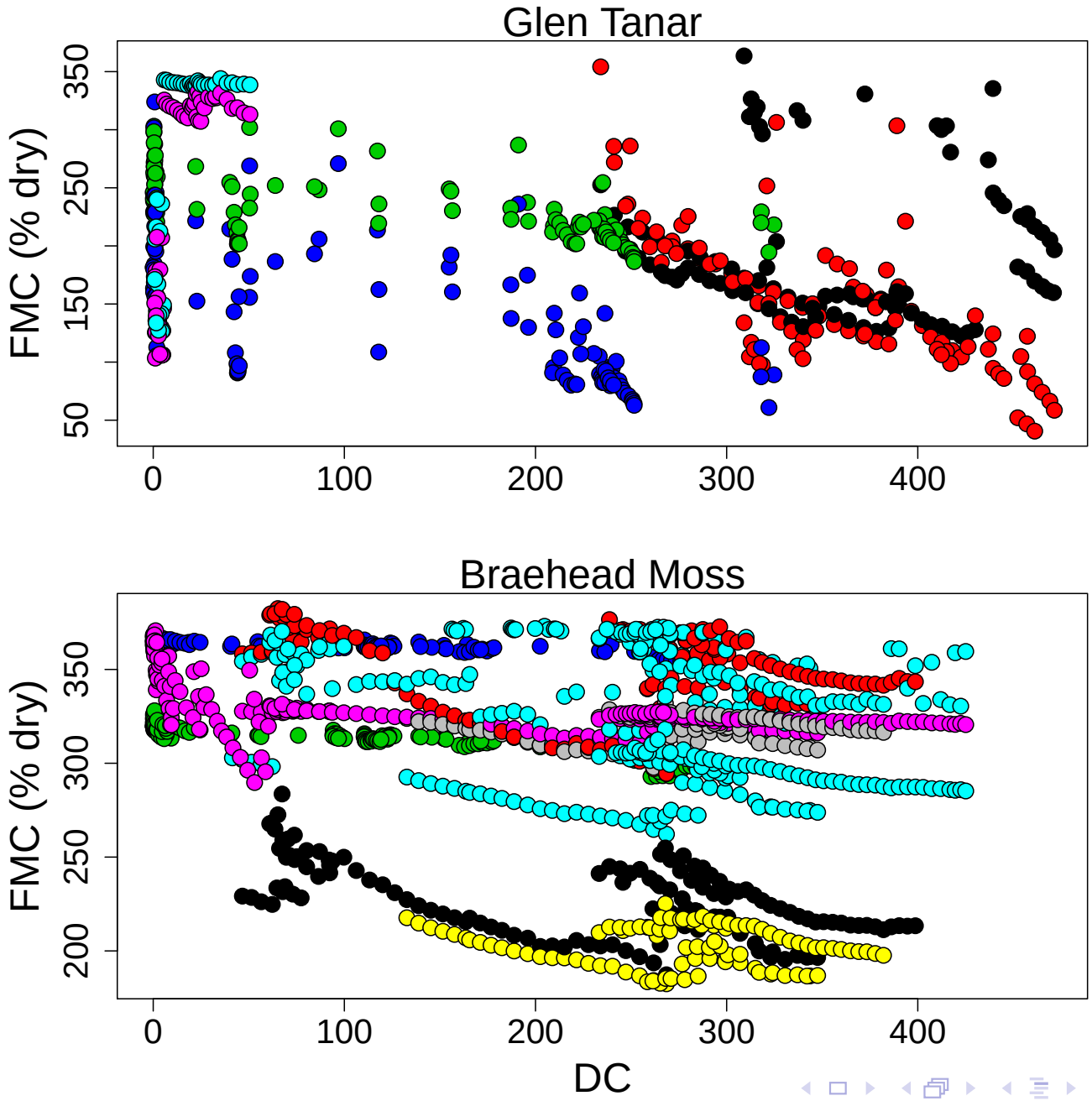
FFMC related to M/L layer FMC



DC related to Peat MC



DC related to Peat MC



Summary and conclusions

- Live and dead heather FMC unrelated to FWI MC
- Good correlation between M/L layer and FFMC

  Important for ignition
  FFMC of 80 for M/L layer FMC < 100 %
- Good correlation between peat FMC and DC

  Important for fire severity
  DC of 400 for Peat FMC < 125 %

Acknowledgements

- Funding and support

- Support