

# How Low Can You Go?

## Burning Under Low-Humidity Conditions



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# Low-Humidity Conditions

We often have days with RH <25%, sometimes <20%

- Drier fuel
  - More intense fire behavior
  - Higher probability of ignition
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- Some units need dry conditions
  - Only so many days in the burn season





# Decisionmaking Process

- Determine acceptable weather conditions (prescription)
- Check forecast, compare to prescription
- Get permission to burn
- Check weather on-site
- Do a test fire
- Decide whether the burn can proceed
- Monitor weather and fire behavior during the burn, decide whether to continue



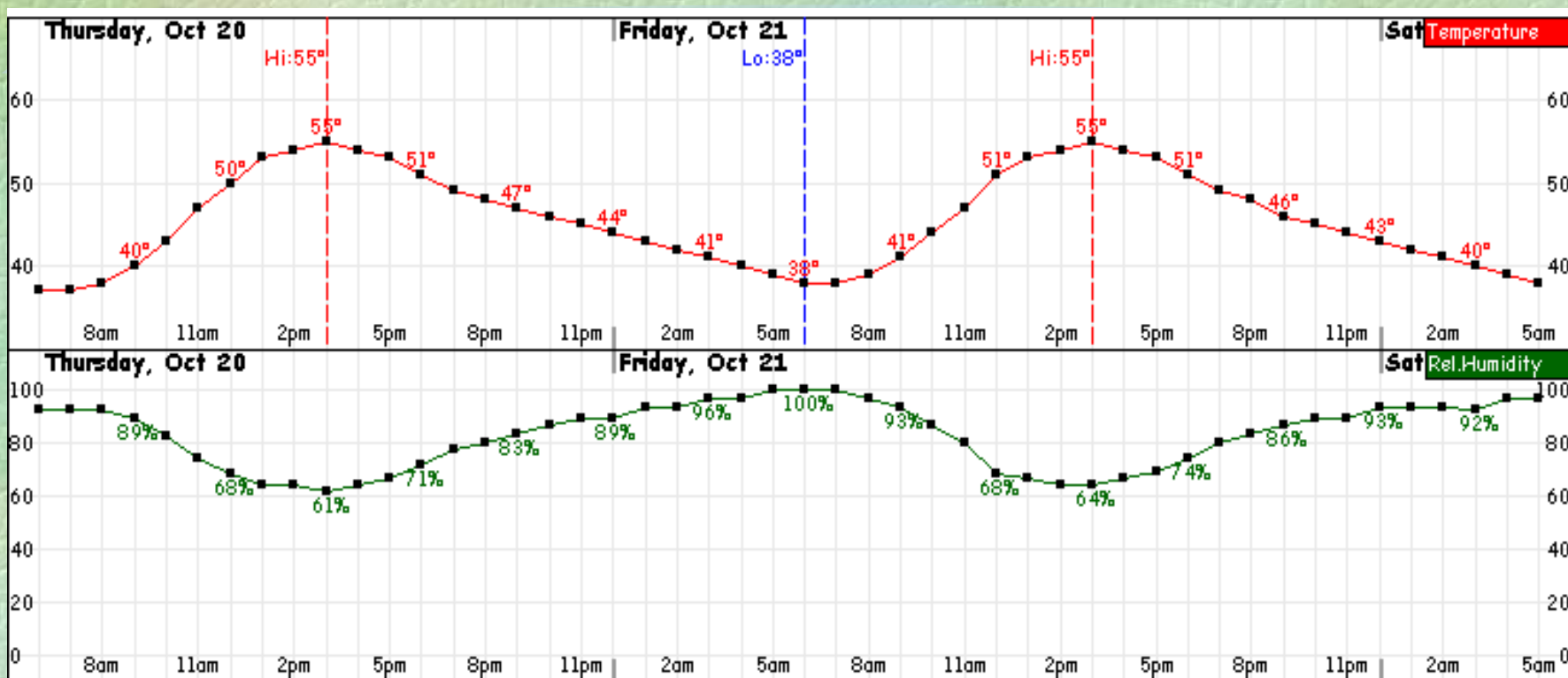
# Establishing Prescriptions

- Fire prescriptions specify an acceptable range of conditions
- Many burn plans use standard prescription ranges
  - ◆ e.g. Temp 40-80° RH 25-60% Wind 3-15 mph
- Some burn plans prescribe an acceptable range of fire behavior



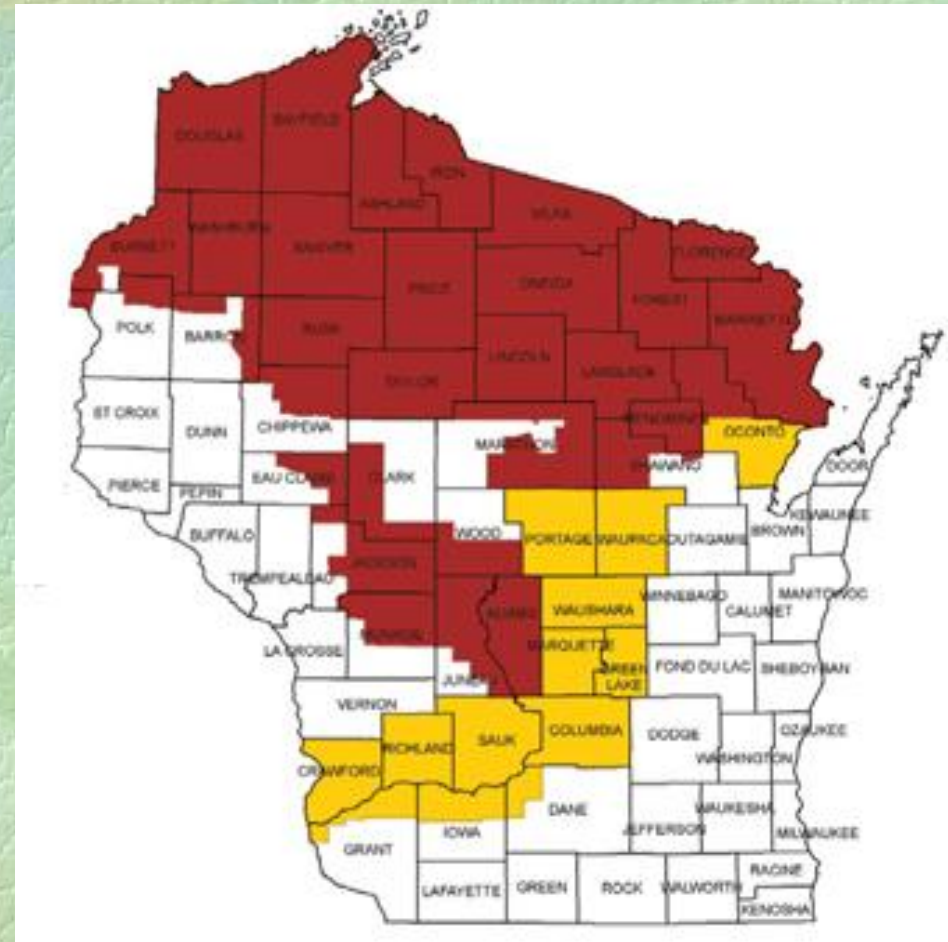
# Humidity Forecasts

- Challenging to forecast precisely
- RH is calculated from temperature and dewpoint
- Forecast for each has an associated uncertainty
- Uncertainty in the calculation is even greater



# Getting Permission to Burn

- DNR approval required for much of Wisconsin
  - ◆ Permit from local forester
  - ◆ Day-of-burn approval
- May be withheld at regional or state level
- Non-DNR regulated areas





# Measuring Humidity

RH is difficult to measure precisely in the field





# Measuring Humidity



Sling psychrometer -

- ◆ two temperature measurements
- ◆ slide-rule calculation
- ◆ compounded uncertainty



# Measuring Humidity

- Electronic (Kestrel)
  - ◆ rated at +/- 3% accuracy
  - ◆ subject to +/- 2% drift over 24 months
  - ◆ smoke, other contamination





# Measuring Humidity

Field measurements are generally accurate to  
 $\pm 5\%$





# Go / No Go Decision

- Current and predicted weather
  - Burn plan requirements
  - Resources on hand
  - Contingency planning
  - Test fire
- Experience



# Shutting Down a Burn

- Fire behavior too intense
- Humidity too low
- Spotting
- What is the safest and most effective approach





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