TRENDS IN PRESCRIBED FIRE ON PUBLIC LANDS IN MISSOURI

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Who’s burning what?
And where?
We just don’t know.
MODIS to the rescue?
MODIS IGNITION DETECTIONS
Not the best...
PUBLIC LANDS RXF – BY AGENCY
PUBLIC LANDS RXF – BY AGENCY

[Graph showing the number of acres managed by different agencies over the years from 1998 to 2012. Each agency is represented by a different color or style, indicating trends and changes in land management over time.]
WILDFIRES AND PRESCRIBED FIRE

The graph shows the comparison of acres burned by wildfires (WF_Acres) and prescribed fires (RXF_Acres) from 1997 to 2011.

- WF_Acres: Displayed with a teal line, showing fluctuations in acres burned annually.
- RXF_Acres: Displayed with a red line, showing lower and more consistent acres burned annually compared to WF_Acres.
WHAT’S THE STORY – DROUGHT

- 4: Severe Drought

4: Very Wet
El Nino

WHAT'S THE STORY

El Nino
EXPLAINING THE BIG STUFF

- PDSI
- RXF_Acres
- WF_Acres

- El Nino (Moderate & Severe)
- La Nina (Moderate & Severe)
WHAT DO WE KNOW SO FAR?

- Fire is widespread in Missouri
- Wildfire acres are increasing, but not very predictably
- Prescribed fire acres on public land are increasing slowly
MODELS

- Generalized linear models (GLM) using stat package in R statistical environment

- Annual Southern Oscillation Index to explain RXF or WF?
  - NOT SIGNIFICANT
MODELS

- Annual Palmer Drought Severity Index to explain Wildfire?
  - Not significant

- Annual Palmer Drought Severity Index to explain Prescribed Fire?
  - Significant! …but not very.
RECAP – WHAT EXPLAINS ACREAGE

Wildfire Acres
- Not annual drought index
- Not El Nino

Prescribed Fire Acres
- Annual drought index
- Not El Nino
FIRE SEASONS

- Fall: September, October
- Spring: February, March, April
MODEL S

- Burn Season Palmer Drought Severity Index to explain Wildfire?
  - VERY SIGNIFICANT

- Burn Season Palmer Drought Severity Index to explain Prescribed Fire?
  - VERY SIGNIFICANT
PRESCRIBED FIRE ACRES AND BURN SEASON DROUGHT
Wildfire and Prescribed Fire may be affected by monthly drought differently
- More drought: less prescribed fire, more wildfire

Confirms the utility of PDSI at the monthly scale...but not annual.
What is MODIS capturing?

- Prescribed Fires
- Wildfires
- Agricultural Burning

MODIS Ignitions
Generalized Linear Models & Significance:

- Prescribed Fires (<0.05)
- Wildfires (<0.10)
- Agricultural Burning

MODIS Ignitions
MODIS CONCLUSIONS

- MODIS is probably capturing prescribed fires, not wildfires.
- Public agencies are burning on the same days that private individuals are burning
Prescribed fire on public land in Missouri is increasing...

...and wildfire is increasing statewide
There is more wildfire during burn windows of drought...

...and less prescribed fire
WHAT WE STILL DON’T KNOW

- Private lands fire: who, what, where, when, and why.

- How much “should” we be burning? Are we in fire surplus or fire deficit?
THANK YOU!

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