TIFMAS 2nd Annual Symposium

June 19th, 2015

Predictive Services Introduction

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Texas A&M Forest Service

Predictive Services Department

- **Formed in Spring 1999**
  - Following Active 1996 & 1998 fire seasons
  - Fireworks law in 1997
  - Outdoor Burn Bans in 1999
  - Beginning of Long-term drought cycle
- **Primary Focus Areas**
  - Fire Danger & Fire Potential
  - Drought & Climate
  - Fire Risk

What Type of Fire Do I Expect to Encounter Today? This Week?

Significant Fire

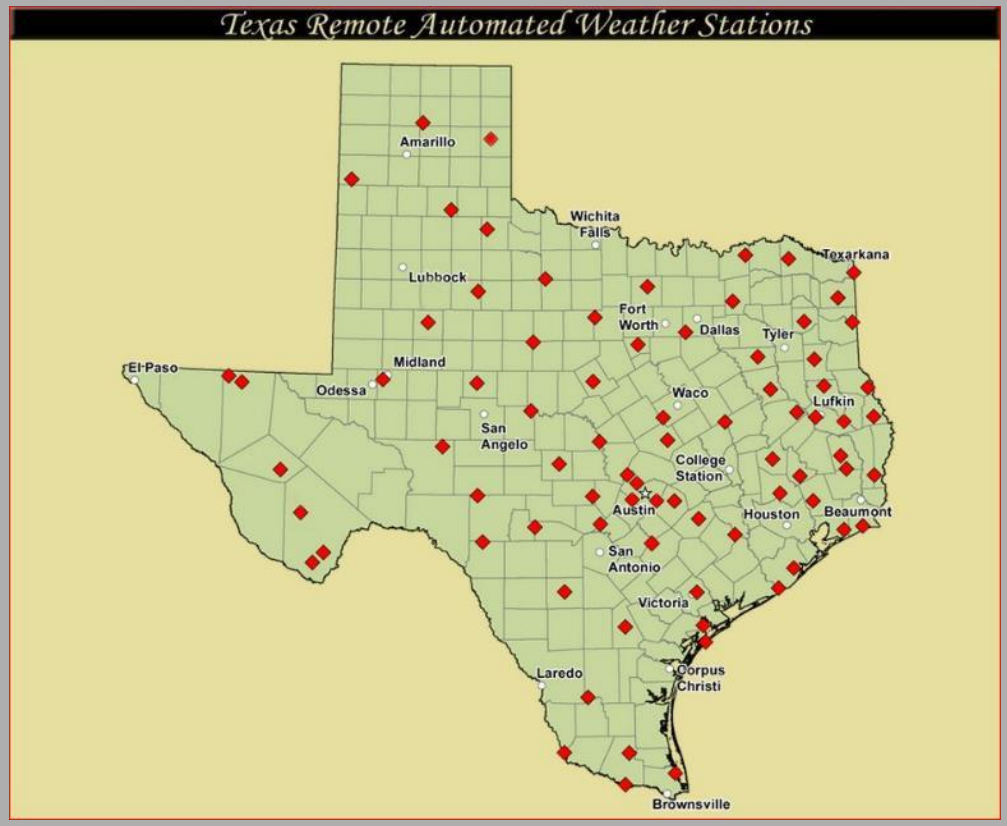
Initial Attack Fire

National Fire Danger Rating System
NFDRS

- Sophisticated mathematical model that integrates existing and expected states of weather and fuels.
- Calculates both numerical and adjective indices.
- Used as a national standard measure for fire potential and fire severity
- NFDRS outputs provide firefighters and fire managers an objective decision support tool that is based in science

Texas RAWS Network

- Foundation for NFDRS Products
- Collects daily weather observations
- Observations are uploaded into national NFDRS processor
- NWS uses observations to produce forecast weather which is uploaded into NFDRS processor
- NFDRS processor uses RAWS observations and NWS forecasts to calculate NFDRS indices such as ERC, adjective fire danger, and dead fuel moistures
- We use NFDRS calculated indices to build decision support tools for firefighters and fire managers



NFDRS Indices

Short Term…no memory

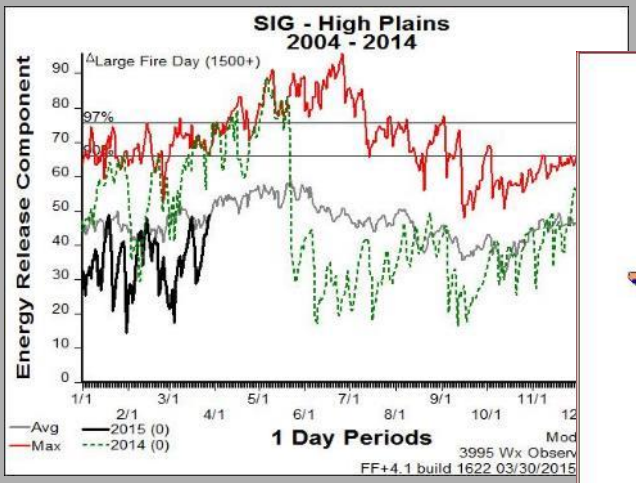
- Adjective Fire Danger
- Burning Index
- 1-Hour Fuel Moisture
- 10-Hour Fuel Moisture
- Spread Component
- Ignition Component

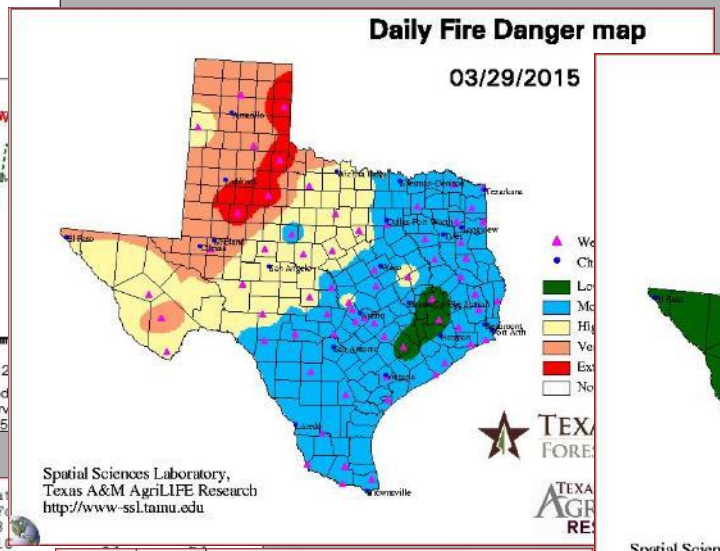
Long Term….build up index

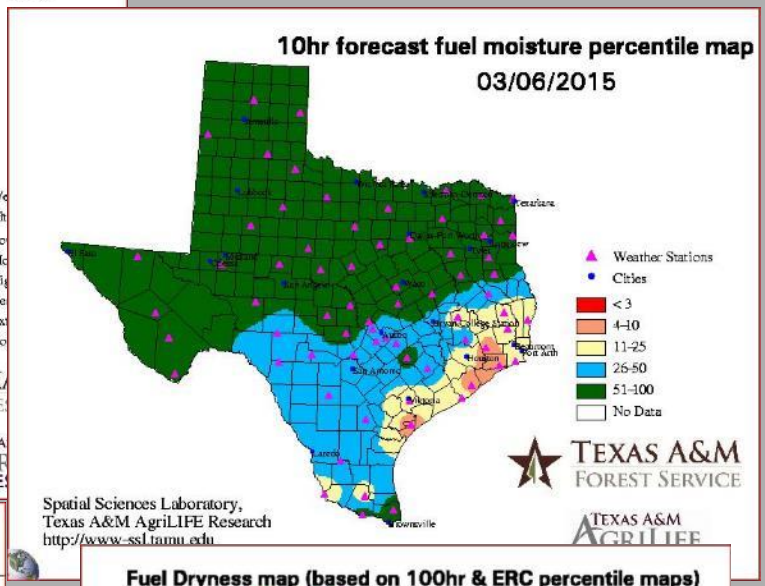
- Energy Release Component
- 1000-Hour Fuel Moisture
- **Fuel Dryness**
  (ERC and 100-Hour FM)

100 hour Fuel Moisture

Build expectations for fires in high risk fuels to prepare for tactical and strategic decisions





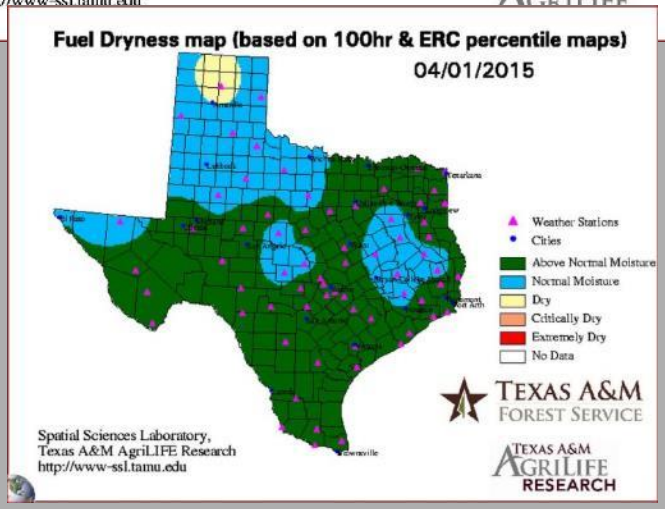


Forecast and Observed ERC and BI Data (Generat

Station	(SID)	Fuel Model	Obs ERC	F
CLARKSVI	(410401)	8G	3	8
TEXARKAN	(410501)	8G	7	10
LINDEN	(411102)	8G	4	7
GILMER	(411401)	8G	9	13
CADDO LA	(411901)	8G	5	7
ATHENS	(412101)	8G	14	14
HENDERSO	(412202)	8G	10	13
PALESTIN	(412601)	8G	16	16
LUMBERJA	(412801)	8G	10	11
ROUND PR	(413101)	8G	17	15
LUFKIN	(413509)	8G	13	14
HUNTSVIL	(414102)	8G	13	13
WOODVILL	(414402)	8G	14	13
KIRBYVIL	(414501)	8G	8	11
CONROE	(415109)	8G	11	12
DAYTON	(415201)	8G	12	14
BASTROP	(415501)	8G	15	16
LAGRANGE	(415602)	8G	9	10
ANAHUAC	(416099)	8G	5	12
SOUTHERN	(416101)	8G	11	11
NEASLONE	(416401)	8G	17	17
ATTWATER	(416601)	8G	6	11
PINERY	(417101)	7G	59	59
FORT DAV	(417201)	7G	47	46
PANTHER	(417401)	7G	48	56
ELEPHANT	(417404)	7G	41	48
BARNHART	(417701)	7G	34	32
MASON	(417801)	8G	24	25
LOST MAP	(417802)	8G	15	17
BIRD	(417901)	8G	16	23
BALCONES	(417902)	8G	17	19
BALCONES	(417903)	8G	20	22
EAST AUS	(417904)	8G	16	17
SOUTH AU	(417905)	8G	16	18
KICKAPOO	(418001)	8G	23	23
MERRILL	(418002)	8G	28	26

Possum Kingdom RAWS 2014

Dispatch Level (Burning Index G (BI))	Preparedness Level (Energy Release Component G (ERC)) 1 (0-50)	2 (51-69)	3 (70-82)	4 (83+)
1 (0-45)	Low	Low	Moderate	Moderate
2 (46-66)	Low	Moderate	Moderate	Moderate
3 (67-80)	Moderate	Moderate	High	High
4 (81+)	Moderate	Moderate	High	Very High



Fire Environment

- Fire Danger, Fire Behavior and Fire Potential all help to describe the fire environment
- All combine fuel conditions and weather to describe fire characteristics or type of fire that a defined fire environment will produce
- The **fire environment** is the combination of weather and fuel conditions that determine the type of fire that will occur. With the addition of topography, the fire environment can describe fire movement and intensities for a specific site.

Fire Regime

- Term used to describe the historical occurrence of wildland fires in a given region
- Can be more descriptive of regional fire problem than fire season which tends to focus on beginning and ending dates
- Example…..Moderate drying in grass dominant fuels on the High Plains will support significant wind driven fire activity during the dormant season. The peak period for experiencing high impact fire weather is mid-February through mid-April…progressive frontal passages

- **Initial Attack Fire:** Type 4 and 5 complexity fire that is contained in one burning period. Low to moderate resistance to control.

- **Large Fire:** by definition (NICC) 300+ acres in grass and 100+ acres in timber

- **Significant Fire:** Type 3 complexity fire. Generally extends into a second burning period with open, uncontained fire edge. Exhibits high resistance to control.

Significant Fire Potential Decision Matrix

- The combination of fire weather and fuel conditions determine daily fire potential.
- ERC represents composite fuel conditions that include live and dead fuel moistures. ERC has a 7 day memory and moves slowly in absence of rainfall. Often used as a weekly planning tool.
- BI represents strength of daily fire weather. It is heavily weighted to windspeed and 1-hr fuel moisture. BI resets each day as it has no memory of yesterday. Closely related to adjective fire danger with many of the same characteristics.

Mason RAWS 2014		Preparedness Level Energy Release Component G (ERC)			
		1 0-41	2 42-61	3 62-73	4 74+
Dispatch Level Burning Index G (BI)	1 0-52	Low	Low to Moderate	Moderate to Low	Moderate
	2 53-77	Low To Moderate	Moderate To Low	Moderate	Moderate To High
	3 78-91	Moderate to Low	Moderate	High	High
	4 92+	Moderate	Moderate To High	High	Very High

SFP for Woods Community Fire

October 2010 in Newton County

Kirbyville RAWS		Preparedness Level Energy Release Component G (ERC)			
		1 0-24	2 25-29	3 30-34	4 35+
Dispatch Level Burning Index G (BI)	1 0-22	Low	Low	Moderate	Moderate
	2 23-34	Low	Moderate	Moderate	Moderate
	3 35-41	Moderate	Moderate	High	High
	4 42+	Moderate	Moderate	High	Very High

ERC.....43
BI.....42

SFP for Double Diamond Fire

May 11th 2014

Cedar RAWS 2014		Preparedness Level Energy Release Component G (ERC)			
		1 0-48	2 49-66	3 67-77	4 78+
Dispatch Level Burning Index G (BI)	1 0-65	Low	Low	Moderate	Moderate
	2 66-96	Low	Moderate	Moderate	Moderate
	3 97-119	Moderate	Moderate	High	High
	4 120+	Moderate	Moderate	High	Very High

	ERC	BI
Cedar RAWS	88	122

Become a Student of the Fire Environment

Texas Interagency Coordination Center

Home | Fire Reporting | Fire Departments | Training | Predictive Services | Incident Response | Other Links

Fuels/Fire Danger | Fire Weather | Fire Outlooks | Fire Intelligence | Preparedness | Drought | Staff | Links

Preparedness

Texas Fire Danger | Fuel Dryness | Fuels | NFDRS Indices | Observations | Forecasts | Drought and Rainfall Deficits

Texas Fire Danger

Observed

Forecast

What Type of Fire Do I Expect to Encounter?
Am I prepared for the next response?

1994 South Canyon

2013 Yarnell Hill

Texas 2006

Yarnell Hill

South Canyon

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