

National Fire Emissions Technical Workshop

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Fire Projections - Overview

- **2018 RPO agreed year**
- **2064? Other years or time periods?**
- **Methods**
 - Survey (GCVTC-Fire Emissions Project/WRAP)
 - Historical/Average Fire Years (VISTAS, WRAP)
 - Ecological Based (WESTAR)
 - Fire Emissions Tradeoff Model
- **Control Scenarios (Thursday Session)**
- **Natural versus Anthropogenic
(maintenance v. restoration - WRAP)**

Fire Projections - Overview

- **Issues:**

- **Accurate vs Realistic vs Representative**
 - Temporal
 - Spatial
 - Emissions
 - Controls
- **Climate and inter-annual variability effects**
- **Range of uncertainty**
 - High vs Low estimates
 - Single estimate

Issues

- **Fire cycles and use**
 - Ecological
 - Political
 - Funding

Example:

1995 Ecosystem Management Focus

- less activity fuels
- small focus in Wildland Urban Interface (WUI)
- less Wildland Fire Use (WFU)

2002 Wildland-Urban Interface Focus

- more activity fuels (how to identify without survey???)
- Most funding focus in WUI
- more WFU

One Method

- **Survey of land federal & state managers**
 - GCVTC-Fire Emissions Project-9 states-Rx Fire
 - WRAP-13 states-Rx Fire, Wildfire Typical, Ag.
- **GIS layers of ownership, vegetation, land use, 50 km model grid-roughly a Ranger District**
- **Database of fuel load, fire type and frequency, control measures 1995, 2015, 2050 (2015 converted to 2018 for WRAP)**
- **Visibility impairing emissions by season**

GCVTC/FEP

FMI/WESTAR

Prescribed Fire & Fuels Treatment Database

GIS

Original

Summarized

Mapping

Weighted Mean by Areas

Remapping

States

50 Km² Grid

Vegetation

Ownership



Ownership

- 1) USFS
- 2) BLM
- 3) FWS
- 4) NPS
- 5) BIA
- 6) O. Fed.
- 7) SPO

FS

FED

SPO

Management Region

- 1) FS/Wild
- 2) FS/nonWild
- 3) Fed/Wild
- 4) Fed/nonWild
- 5) SPO

EcoRegion



New Veg

Management Region

- 1) CR
- 2) AW
- 3) RR
- 4) MX
- 5) UN

Wilderness

NonWilderness



Database

- 1) PFi
- 2) PFm
- 3) PNF
- 4) PFb
- 5) PFp
- 6) Mech

RxN

RxA

Spring

Fall

Spring

Fall

RxN spring

RxN fall

RxA spring

RxA fall

RxN spring

RxN fall

RxA spring

RxA fall

RxN spring

RxN fall

RxA spring

RxA fall

Map Combinations

Map Outputs

Phase I

Phase II

Phase III

Phase IV

Phase V

Section 309 and Smoke Management

- (i)...smoke management programs that include all necessary components including, but not limited to, actions to minimize emissions, evaluation of smoke dispersion, alternatives to fire...
- (iii) Identification and removal wherever feasible of any administrative barriers to the use of alternatives to burning...
- (v)...minimize emission increases from fire to the maximum extent feasible

2018 Emission Projection Scenarios

Types of Fire

**Emission Control
Scenarios**

<i>WRAP Run</i>	<i>Rx Fire</i>	<i>Ag Burning</i>	<i>Wildfire</i>
2018 Base and 1996 Base Cases	GCVTC-FEP Plus Base Smoke Mgmt.	FEJF Base Smoke Mgmt.	FEJF Typical Yr. 1996 Wildfire Normalized
2018 All Control	GCVTC-FEP Plus Optimal Smoke Mgmt	FEJF Optimal Smoke Management	FEJF Typical Yr. 1996 Wildfire Normalized
	No Smoke Management	No Smoke Management	

GCVTC-FEP 2018 Rx Fire Optimal Smoke Management Techniques

- **Backing Fires**
- **Burn Before Green-up**
- **Burn Before Large Fuels Cure**
- **Firewood Sales**
- **High, Large-Diameter Fuel Moistures**
- **Mass Ignition/Shortened Fire Duration**
- **Moist Litter and/or Duff**
- **Other Biomass Utilization**
- **Rapid Mop-Up**
- **Underburn Before Litter Fall**
- **Whole Tree Harvesting and/or YUM**

Caveats – Emission Inventory

- **Projections (1995 FEP emission estimates)**
 - Modeled/theoretical emission estimates based on combinations of field data and expert opinion (e.g., literature, survey)
- **Event sizes**
 - Establishing “realistic” fire sizes
 - Recreating historic fire size distribution in 2018 forecasts
- **Plume characteristics**
 - Combination of empirical data and expert judgment

Ecological Approaches

- **WESTAR**
 - Prescribed fire
 - Wildfire
- **Fire Emissions Tradeoff Model (FETM)**