

# Western Regional Air Partnership Fire Emissions Tracking System

2<sup>nd</sup> Fire Behavior and Fuels Conference  
March 26-30, 2007 - Destin, Florida  
Track 7 - Wednesday, March 28 - 1325-1350

# WRAP FETS - *What is it?*

- Storage Device for Fire Activity Data
  - Efficient data acquisition
  - Automated and custom QA/QC
  - Version control / archiving / back-up
- Real-time Information Tool for Smoke Management Programs
- Cost Effective Data Retrieval Tool
- Integrates Fire Data into Regional Haze SIPs

# WRAP FETS - *What's in it?*

- Stored values for each fire event
  - User ID of record creator
  - timestamp of creation/last edit
  - Unique DB ID for each fire event
    - not necessarily public
    - link to each daily record (i.e. ID goes with event, not record)
  - Minimum data elements required:

Date of Burn	Burn Location
Area of Burn	Fuel Type
Pre-Burn Fuel Loading	Type of Burn
Natural/Anthropogenic	Annual Emission Goal Info
Projections	Emissions

# WRAP FETS

## *What Does it Deliver?*

- Real-time information on planned events
  - Maps
  - Fire Statistics
- Historic emission inventories for fire (all types)
- Data for the WRAP's Technical Support System (TSS)

# WRAP FETS

## *Hard- & Software Requirements*

- A reliable, secure web-hosting server to act as the gateway for all FETS users.
- Server storage space sufficient for database record storage and archiving well into the future, on the order of 100 GB.

# WRAP FETS

## *Hard- & Software Requirements*

- A secure, easy-to-implement database software package and development environment.
- Simple, efficient, “commodity” programming language and software packages to communicate with the database, control data mining, and provide an effective, fully-functional web interface.

# WRAP FETS

## *Objectives for the End-Users*

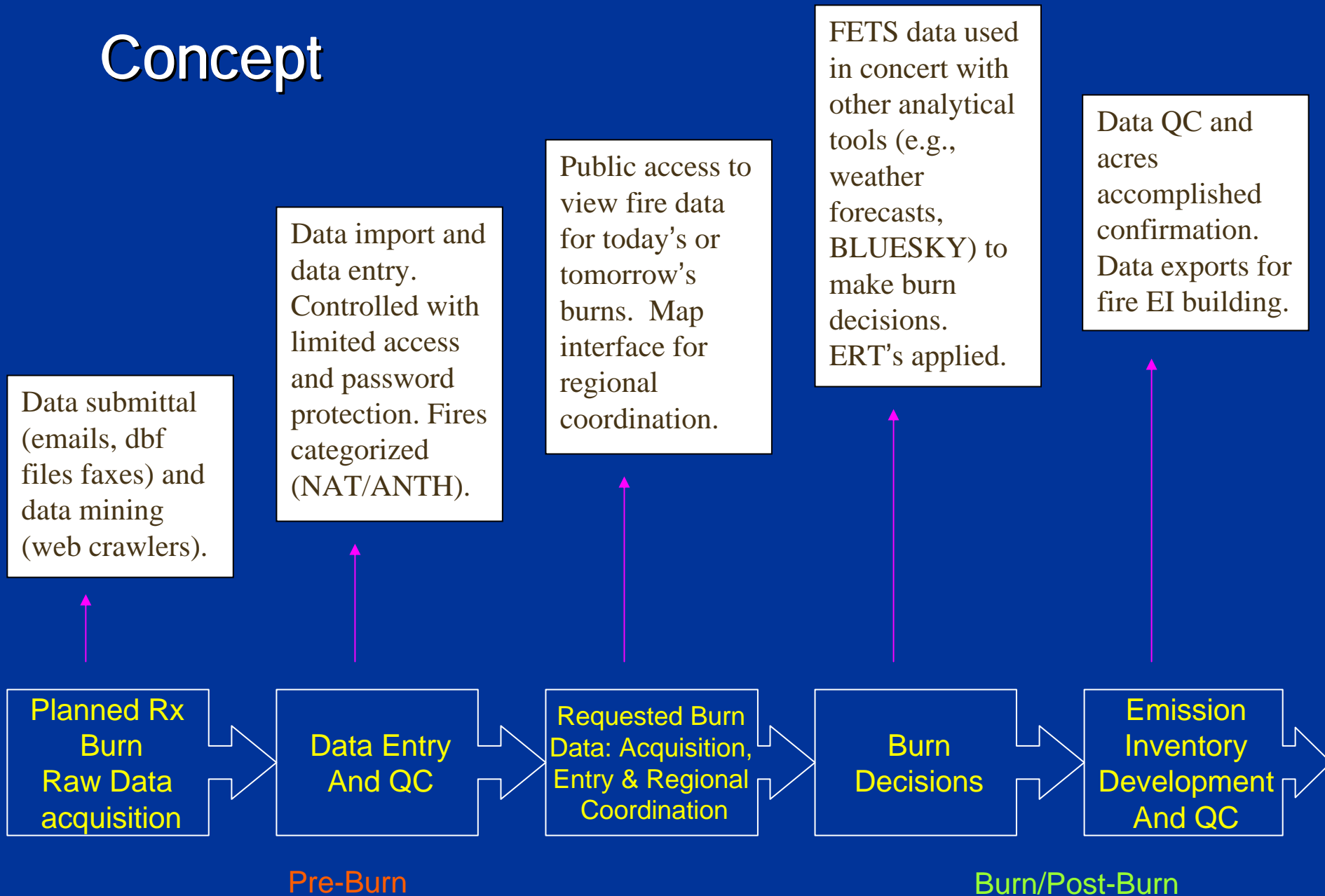
- Efficient data acquisition.
- Real-time data review.
- Convenient data Quality Assurance/Quality Control.
- Flexible queries to acquire data.

# Brainstorm

## PRE-BURN



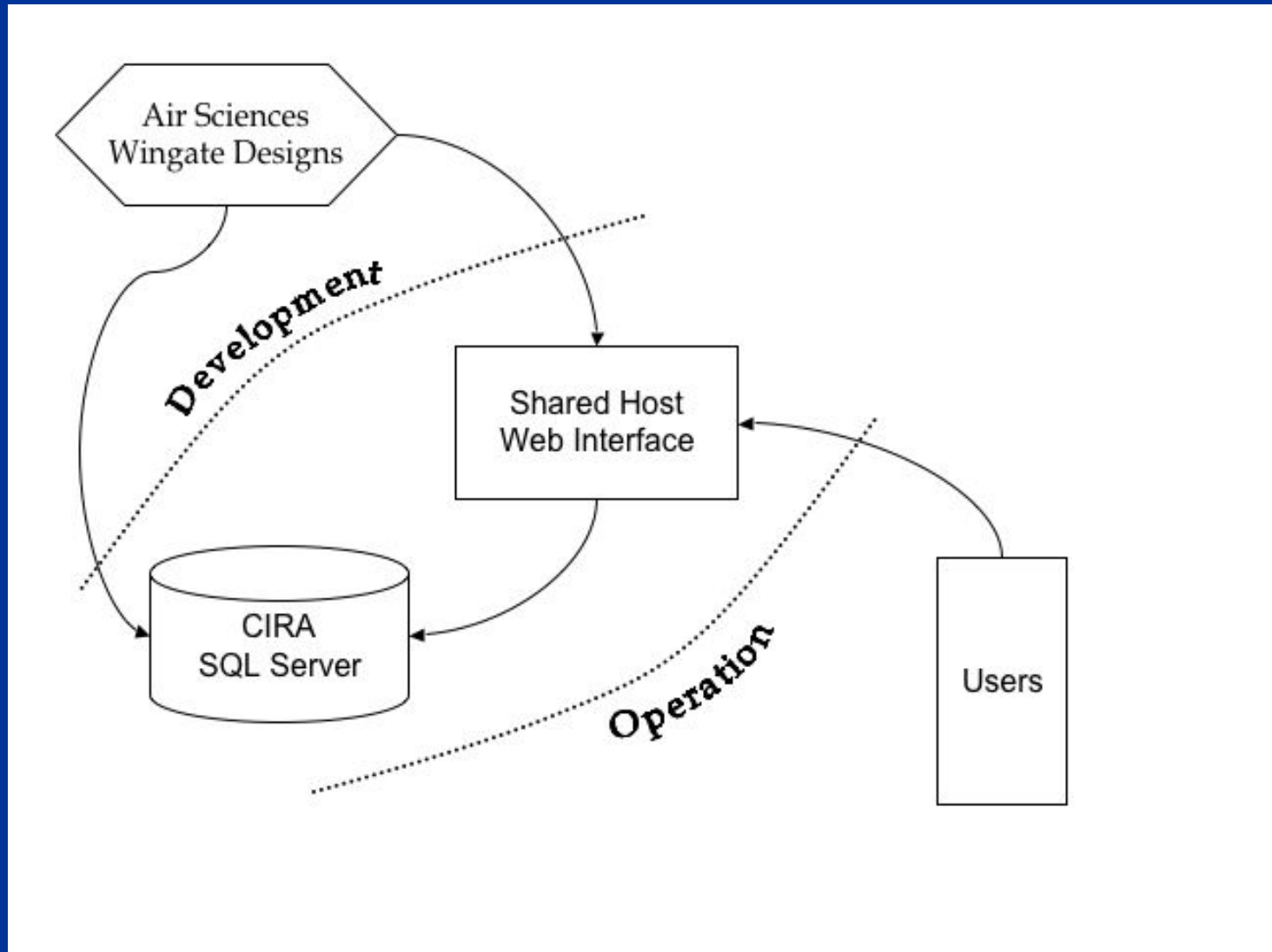
# Concept



# Mechanics

	<u>Data Tag</u>	<u>FETS Function</u>	<u>Action</u>	<u>Who?</u>	<u>What?</u>	<u>When?</u>
Pre Burn	E(ntry of all planned burns)	<b>Planned Rx Burn Raw Data Acquisition</b>	Data collection & submittal (for WF, web crawler for data acquisition)	Federal Land Managers (FLM); private (timber) industry; state forests; private land owners	Planned burning events; Updates	1x per year (dbf) Real time web interface
	L(ibrary of all burns in FETS)	<b>Data Entry and QC</b>	100% of data entry and data manipulation	Smoke Management Program (SMP) personnel (State/Tribe/Local)	All submitted events and updates	Upon submittal
	R(equested burns)	<b>Requested Burn Data Acquisition, Data Entry, &amp; Regional Coordination</b>	Requested burns "posted" for regional coordination and burn/no-burn decision	Burners request and SMP assigns Data Tag All can view requested burns (Regional Coord)	Burn requests	1-2 days pre-burn
Burn/Post Burn	G(go/no-go ... approved burns)	<b>Burn Decisions</b>	Burn approval	SMP All can view approved burns (Regional Coord)	Approved burns	1 day before burn or day of burn
	A(ccomplished burns)	<b>Emission Inventory Development and QC</b>	Burn confirmation	SMP (with input from burners) All can view accomplished burns (SIP planning)	Accomplished burns	Post burn

# Basic Architecture



# Critical Functions

**COLLECT AND STORE**

**Output Results**

Level 1 QC

Level 2 QC

Level 3 QC



Improve quality of emissions estimates

After day-to-day regional coordination, how to make data better?

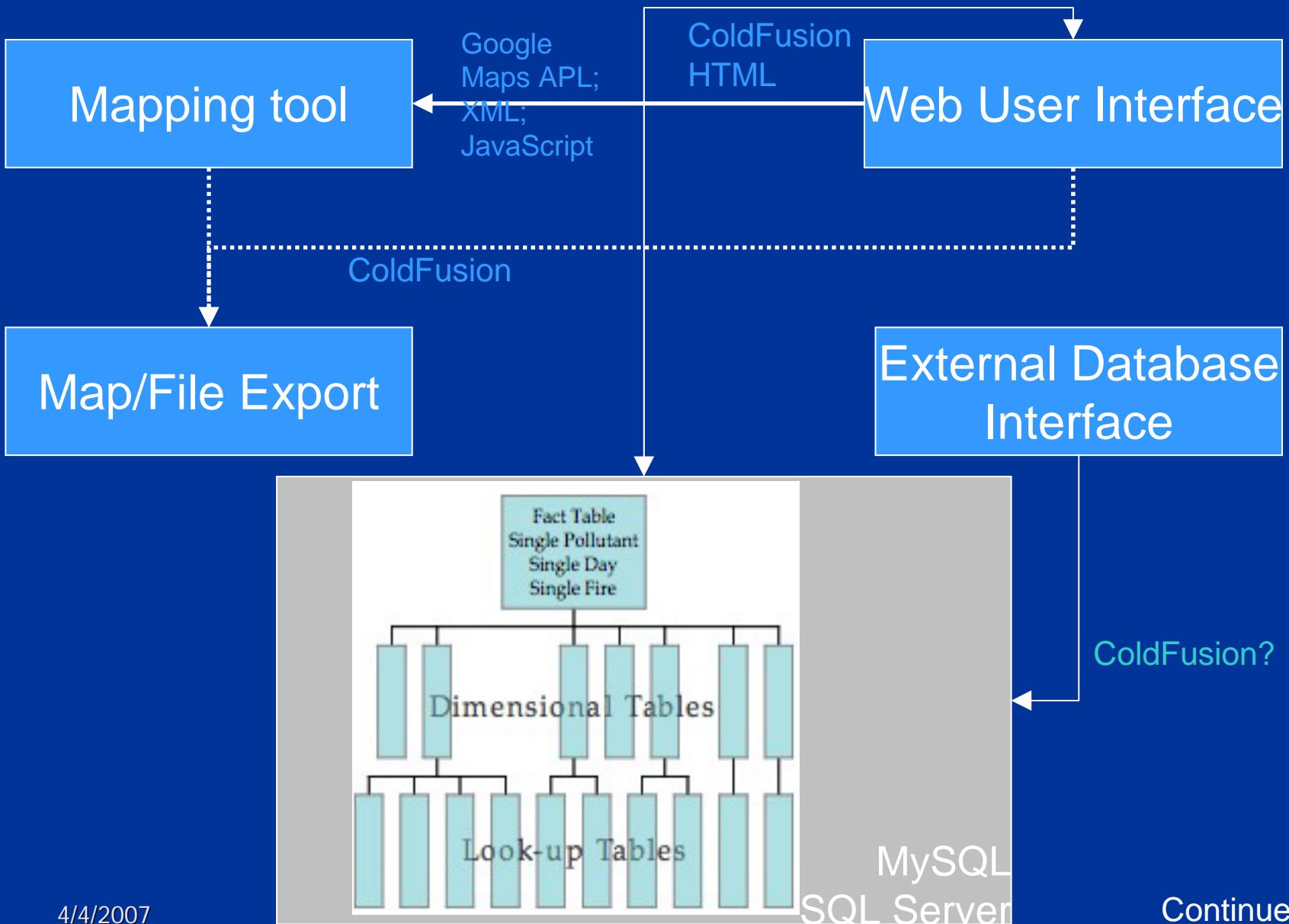
Will it require additional reporting?

## Intended Use of the Data

- Planned emissions/regional coord (very frequent use)
- QC'd data/periodic reporting
- Refined emissions for input to modeling

TSS

# Features



# Data Acquisition

- Batch uploads
  - Minimize “new” effort for data collectors/providers
  - Requires up-front coordination
    - State SMPs
    - Federal data sources
  - Combined effort
    - Post to common FTP
    - Periodic data mining
- Individual planned fire events
  - Web interface
  - “always on”
  - Data entry, review, & QA/QC functions.
- Unplanned Events
  - Periodic web-mining
  - Similar coordination with FLMs

# Example Crosswalk

FETS Field Descript.	MT/ID	WA	OR
Permit ID	UnitID	BPMT_NO	
County	Location	COUNTY_CD	CNTY
Agency	Office		OWN
Latitude	Lat	BP_LAT_COORD	LAT
Longitude	Lon	BP_LON_COORD	LON
Planned Acres	Acres	PLN_BURN_AREA	

# Unresolved Issues

- Appendix in Work Plan as “place holder”
- FETS Task Team oversight
  - “Strawman” Process
- Elevated to Work Plan and technical direction/methods are decided.

# Unresolved Issues

- Data Acquisition
  - Additional coordination with existing systems?
  - Standard format for data upload?
- Emissions
  - Emissions calculator (options: WRAP method, CONSUME, FEPs, other?).
  - Fuel loading/consumption scheme.
  - Consistency:
    - Same method for all events?
    - Allow state/Tribe-provided emission estimates?

# Unresolved Issues

- Emissions
  - Emission Reduction Techniques (ERT)
    - Gather information.
    - Provide ERT look-up and/or “default” ERT.
    - Quantify emissions averted.
    - Account for alternatives to burning?
  - Annual Emission Goals (AEG)
    - Internal tracking of application rate of ERTs.

# Unresolved Issues

- Fire Data Idiosyncrasies
  - Long duration landscape Rx burns (daily data can be spotty).
  - “Daily-izing” Event-only (multiple day) data
    - (e.g., “expanding oval,” FEPS Fire Growth algorithm, equal acres/day).
  - Get it all but don’t double (or triple) count.
    - Project Acres vs. Requested Burn(s) Acres vs. Accomplished Acres

# Milestones

- FETS DRAFT WORKPLAN (March 23, 2007)
- FETS Operational (BETA ver) - June 2007
- Annual Emission Goal demonstration tool (June 2007)
- Integration of fire data to WRAP TSS (continuous)
- Tools to integrate fire emissions into TSS data analyses & summaries (Fall 2007)
- Training
  - TSS Workshop in Denver - 6/19/2007
  - Emissions Inventory "Lessons Learned" meeting - mid-Sept. 2007
- Documentation
  - Technical Support Document
  - FETS User Guide



# Links/Contact Information

- WRAP/FEJF webpage dedicated to ERT work:
  - <http://www.wrapair.org/forums/fejf/documents/fts/index.html>

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# Questions?