

The Western Regional Air Partnership Fire Emissions Tracking System

2009 Region 10 Smoke Managers Meeting
April 30, 2009
Spokane, WA

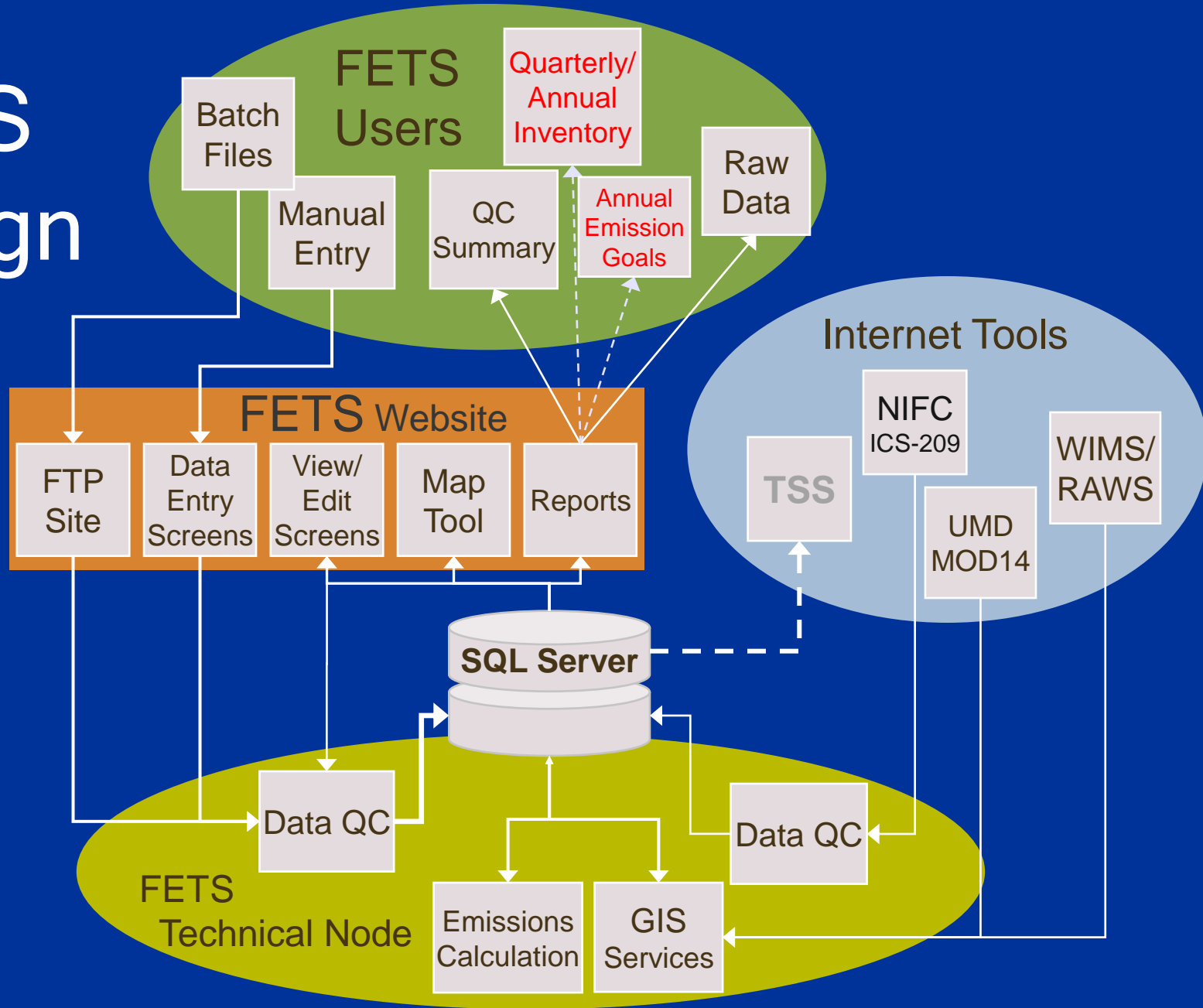


Opening Remarks

The FETS is

- intended for regional coordination of fire activity and storage/retrieval of fire activity and emissions data.
- a “commodity based” system requiring only access to the Internet to upload, view, and report data.
- housed at the Cooperative Institute for Research in the Atmosphere (CIRA) and is managed by the WRAP.
- A modular system that allows customization for specific user needs.

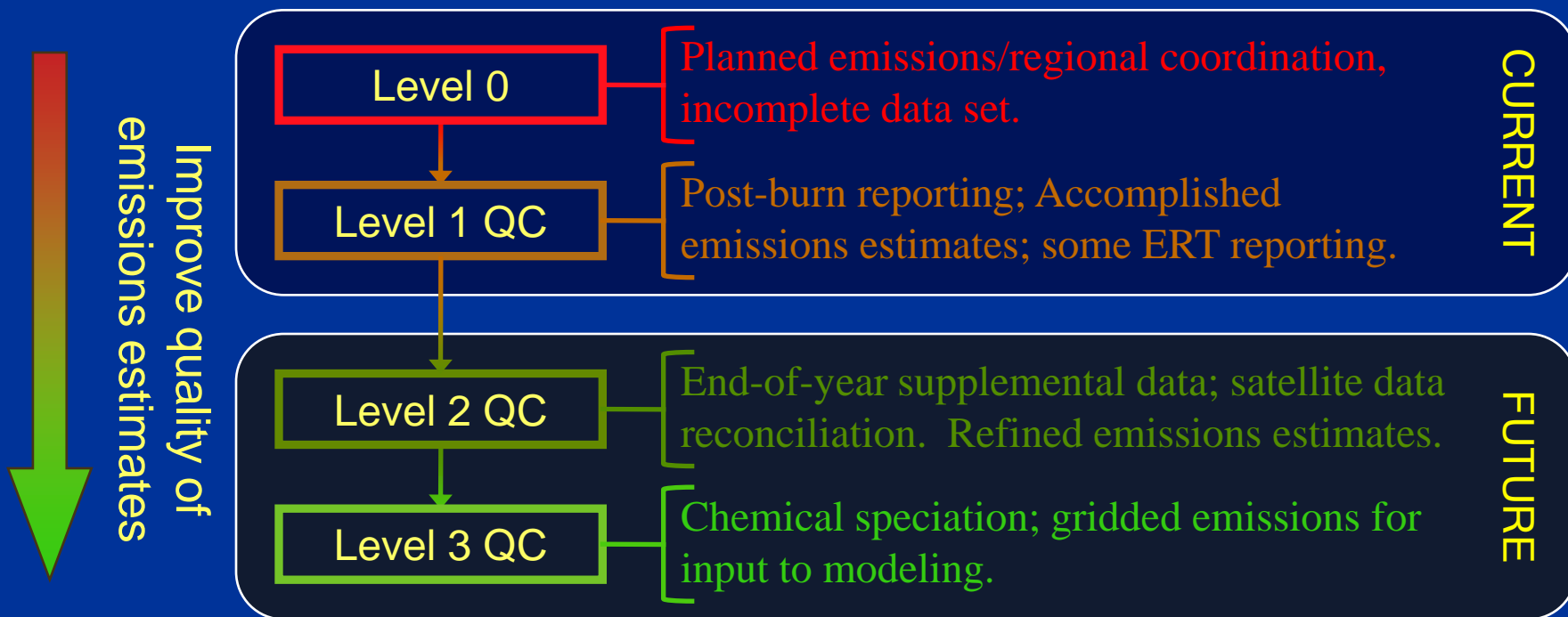
FETS Design



Critical Functions of the FETS



- Storage Device for Fire Activity Data
- Real-time Information Tool for SMPs
- Portal for all fire activity/emissions within WRAP modeling domain.



Region 10 Data Acquisition Status

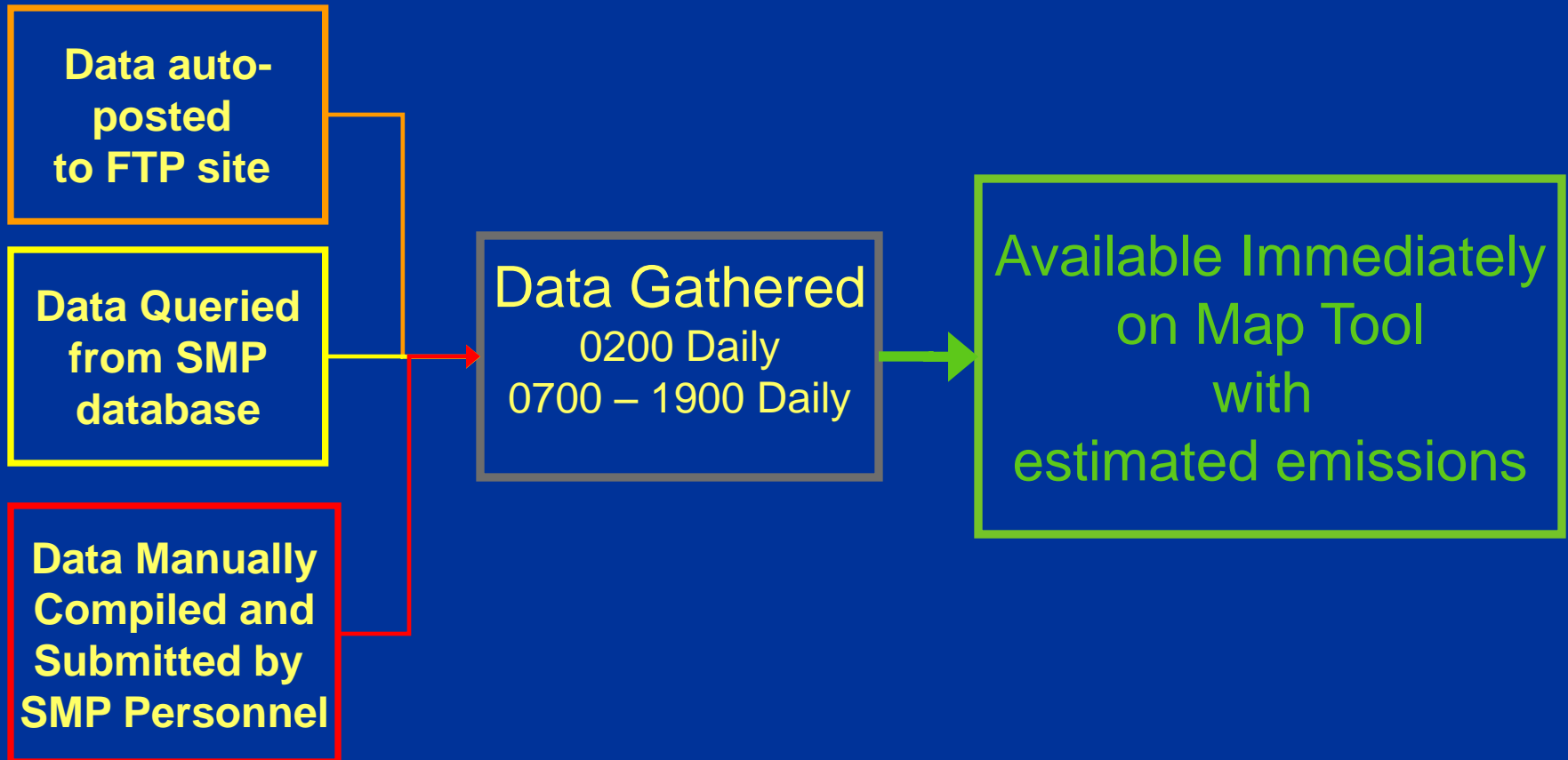
<i>Provider</i>	Federal	State	Private	Agricultural	Rangeland
Oregon	X	X	X	X**	
Washington	X	X	X	X**	
Alaska	X	X	X		
Idaho	X	X	X	X	
Nez Perce Tribe			X	X	X
Montana	X	X	X		
Utah	X	X	X		
Wyoming	X	X	X		

**Accomplished Data Only

- Data stream **active**
- Data stream **pending**
- Data stream **known, not initiated**

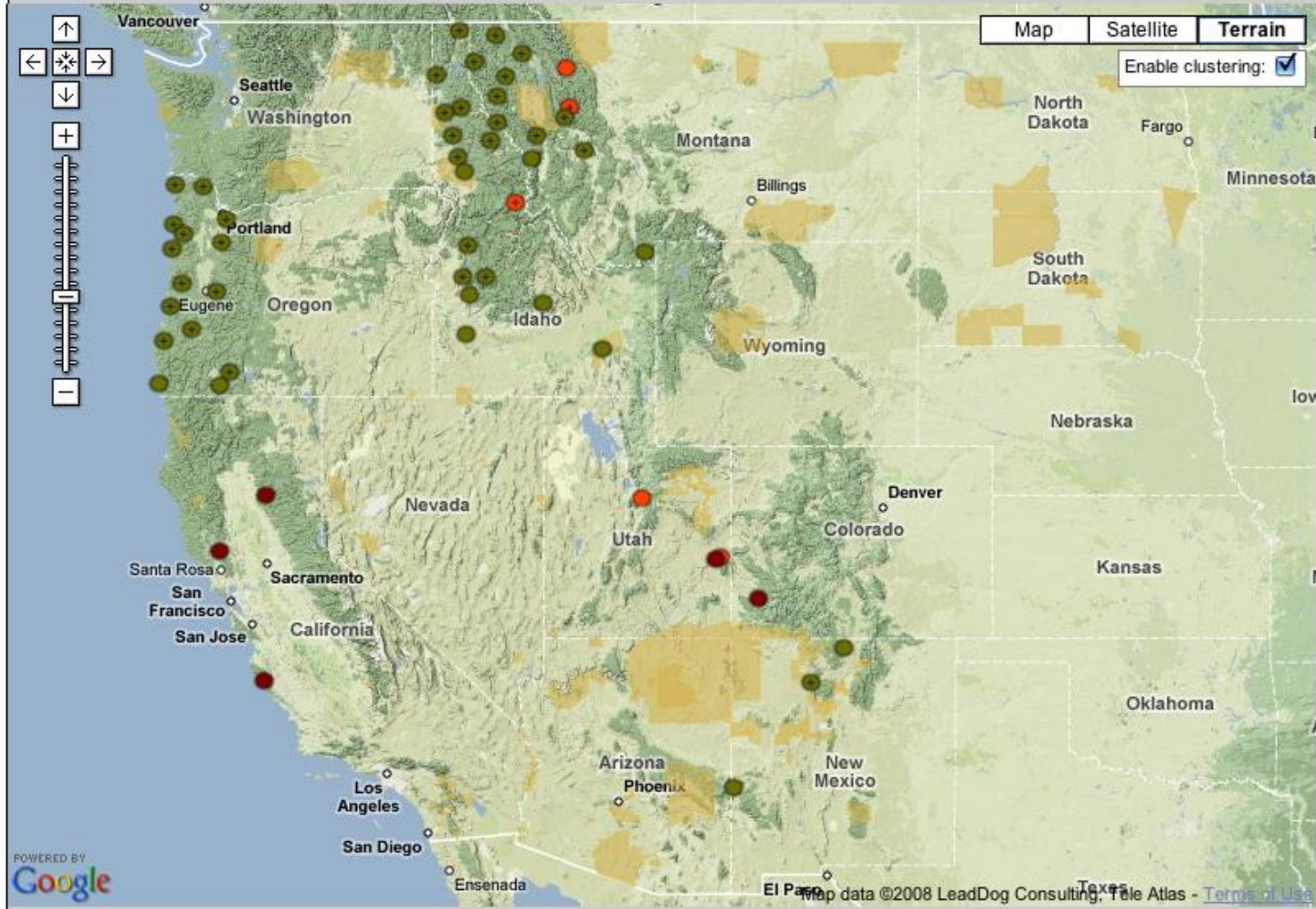
Regional Coordination

Real-time Access to Planned Burns



Start: 11/4/2008 End: 11/4/2008 Display: Center:

Overlays: Tribal Lands Class I Areas Latest Fire Detections



Key: ● Prescribed Fire ● Wildfire ● Wildland Fire Use ● Agricultural Fire ● Non-Federal Rangeland

Start / End Dates

Advance / Retreat One Day

Summarize by

State
County
Tribe

Center Map
Lower 48 States
Alaska

Start: 4/17/2009 End: 4/17/2009 < > ? Display: All Events Center: Lower 48 Submit

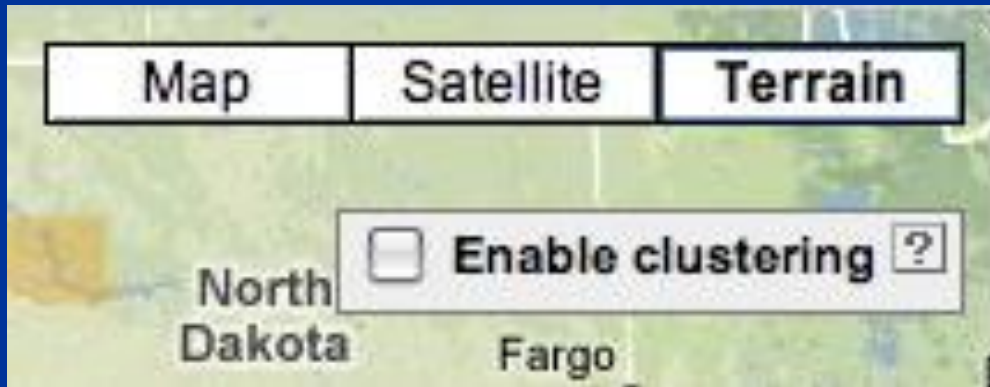
Overlays: Tribal Lands ? Class I Areas ? MODIS Fire Detections ? Data Status

Overlay Tribal Lands
In WRAP Region

Overlay
Mandatory Class I Areas
Within WRAP Region

Overlay MODIS
Fire Detections For
Chosen End Date

View the Latest
Data Acquisition



Agricultural fire

04/17/2009 - 04/17/2009

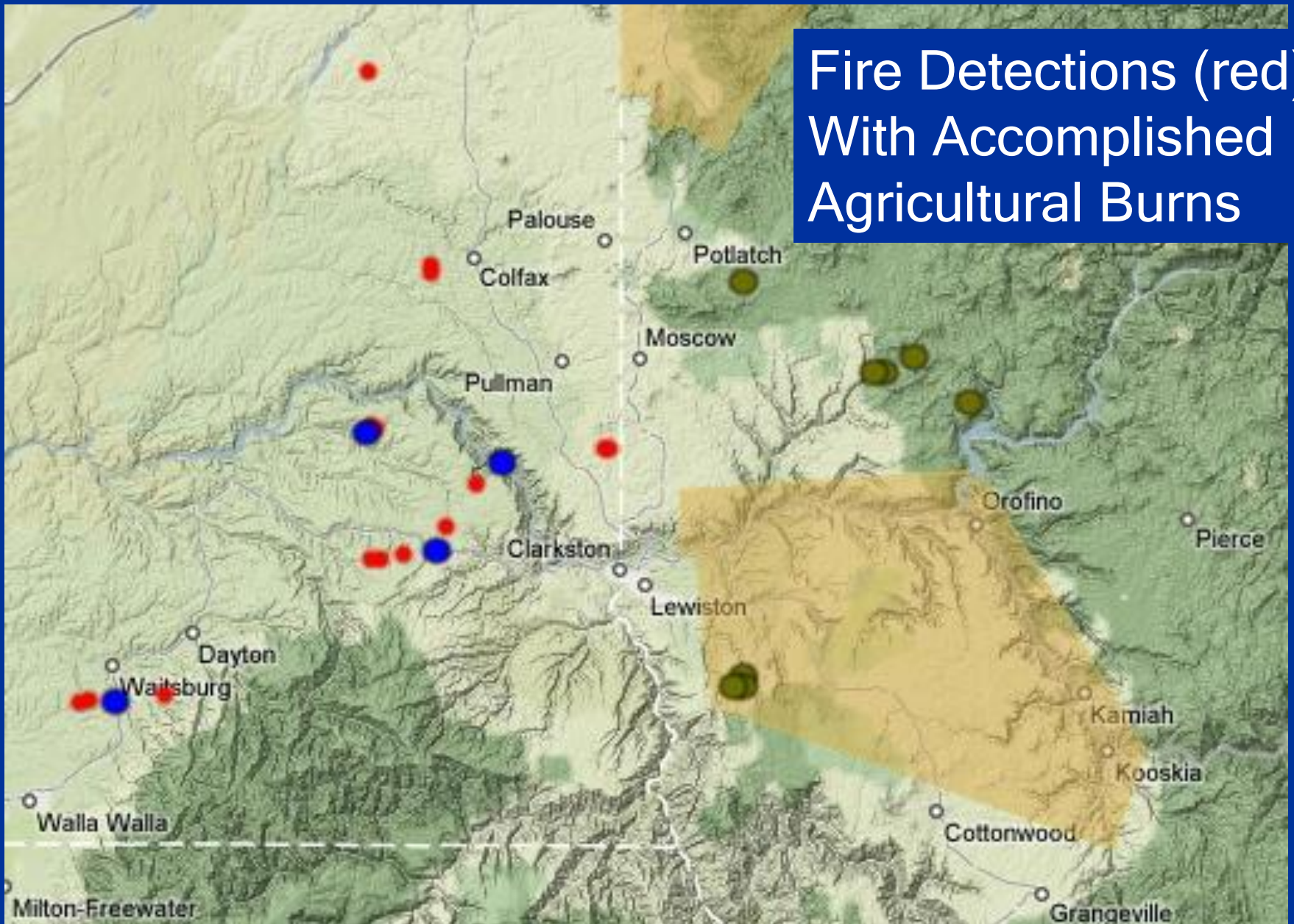
Reported burns: 1
Planned acres: 50.0
Burns using
ERTs: 0
Total PM_{2.5}
emissions: 1.21 tons
Reporting Tribe: Nez Perce
Data Source: Nez Perce ERWM Air Quality
Program
Last Updated: 2009-04-17 10:46:00.0

***Location accurate to within 1 mile**

Summary Stats:

- Number of Burns
- Acres (Planned or Accomplished)
- Emissions Estimate (AP-42)
- Data Source
- Last Update

Fire Detections (red) With Accomplished Agricultural Burns



Start: 3/13/2009 End: 3/13/2009



Display: All Events

Center: Lower 48

Submit

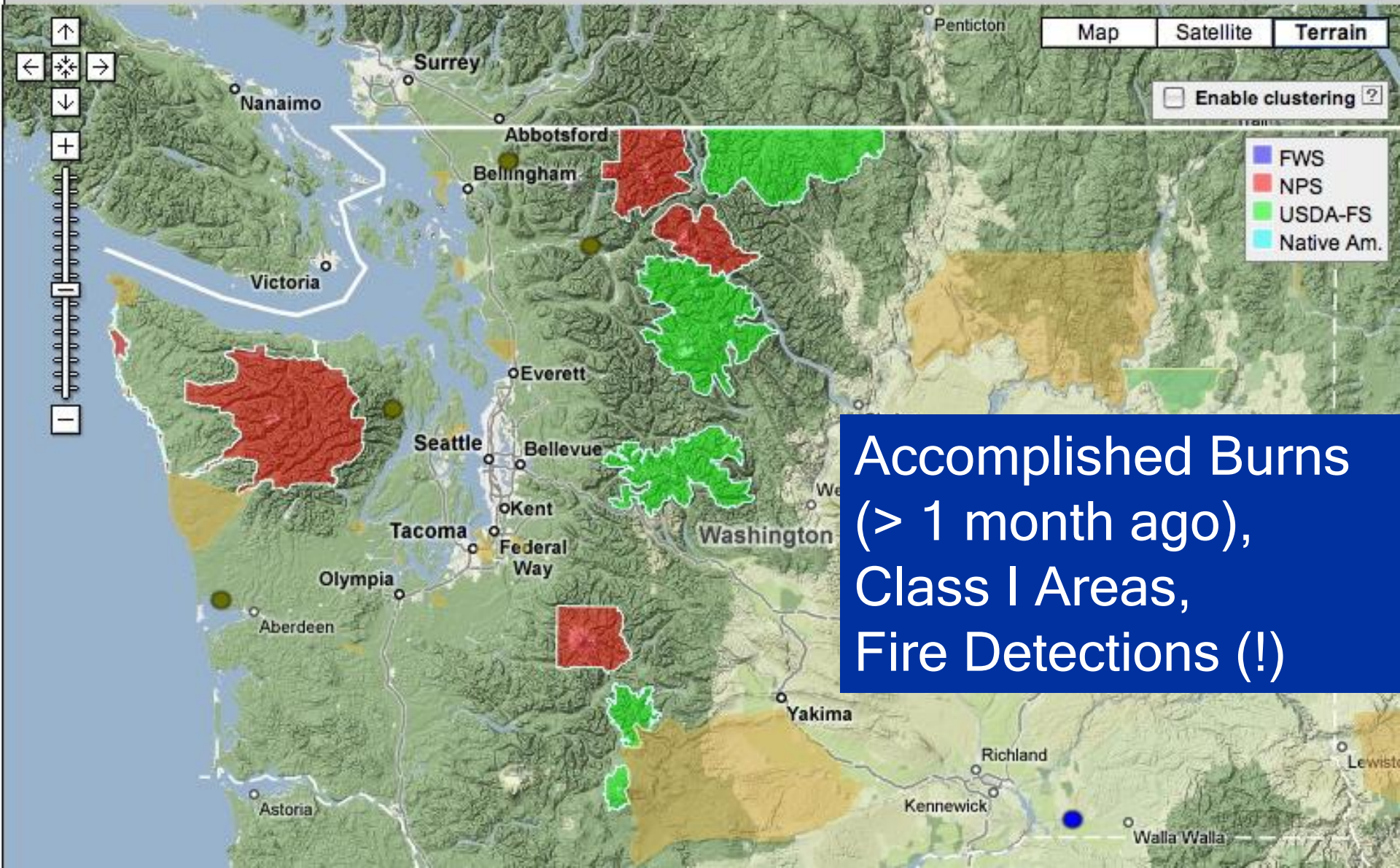
Overlays: Tribal Lands Class I Areas MODIS Fire Detections

Data Status

Map Satellite Terrain

Enable clustering

- FWS
- NPS
- USDA-FS
- Native Am.



Accomplished Burns
(> 1 month ago),
Class I Areas,
Fire Detections (!)

FETS Support for Agricultural Burning

Emissions Calculations

- Fuel Loadings for 40+ different crop types
- Basic 'Ag' class when fuel not specified (Overlay)
- Modified AP-42 calculation method
- Calculate Emissions Averted from applied Emission Reduction Techniques

Storage Flexibility

- Field numbers, names not stored
- Conversion from T/R/S to Lat/Lon

FETS Support for Forestry Burning

Emissions Calculations

- Fuel Loadings may be user-provided
- FCCS-based fuel types when not supplied (Overlay)
- CONSUME emissions calculations
- Support for pile burn calculations
- Calculated Emissions Averted from applied Emission Reduction Techniques

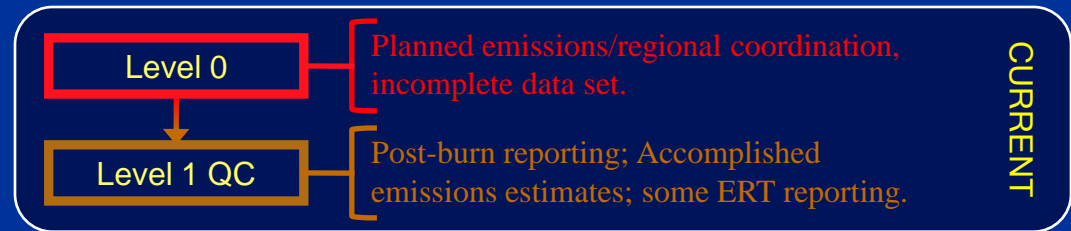
Alternatives to Burning

- Select and store Emission Reduction Techniques
- Accomplished Acres = 0 + ERT can imply alternative treatment

Ongoing Work

Improving Fire Activity Data

What We Get Now



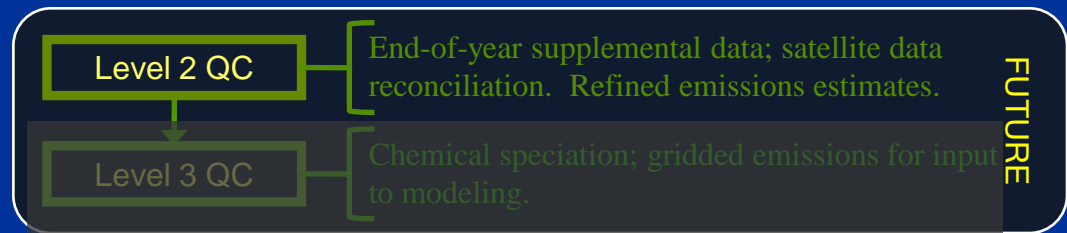
Spatial Coverage and Activity

- Federal Lands for wildfires and WFU (ICS-209)
 - >100 acres timber
 - >300 acres grass/brush
 - Fire Growth based on changes in perimeter
- Active Smoke Management Programs
 - Prescribed, Agricultural, Non-Federal Rangeland
 - Wildfires, WFU (AK, NM)
 - Daily, real-time reporting (mostly)

A large number of small wildland fires go unreported.

Reporting varies across states and Tribes with SMPs

Where We're Headed



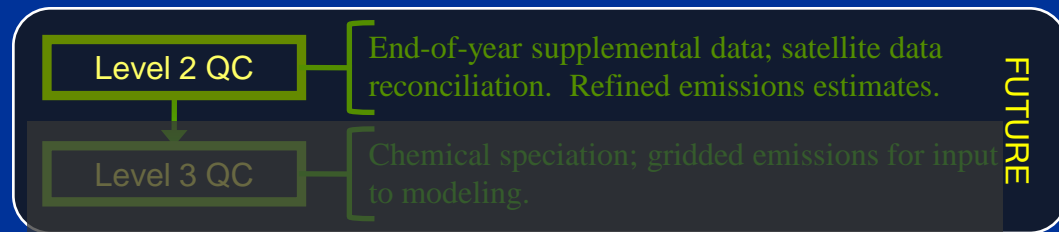
- Spatial Coverage

- Capture SW Canada and N Mexico.
- Capture small wildland fires on Federal Lands.
- Capture and categorize planned fires to lessen the effect of variations in SMPs.

- Fire Activity Data

- Fill in spatially and temporally for all fire types.
- Use detects from one or more satellite products.
- Use land use and land cover data to classify unreported fire detects.

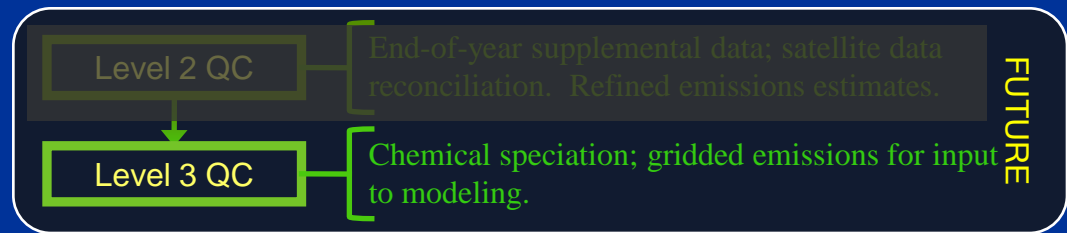
Where We're Headed



- Fuels Information – reported events
 - User-provided
 - FCCS fuel category
 - GIS FCCS tool
 - CONSIDER:
 - Weighted fuel loading for event-day.
 - Using unique fuel loading for each fire detect.

- Fuels Information – “unknown events”
 - Develop methods for a “first principals” estimate of fuel loading, emissions, and fire type assignment.

Where We're Headed



Primary Goals for Level 3 data:

- Free-standing replacement for SMOKE fire emissions modeling:
 - 3-dimensional hourly emissions
 - Enhanced chemical speciation
 - Gridded emission inventory
- Create calendar-year product annually by March 31st of the following year.
- Maintain Level 2 activity data quality and completeness.
- Develop chemical speciation specific to fuel loading and fuel characteristics for each fire event.
- Report QA and analysis steps to prepare Level 3 data.
 - Disclose method for estimating speciated fire emissions.
 - Peer-reviewed publication required.

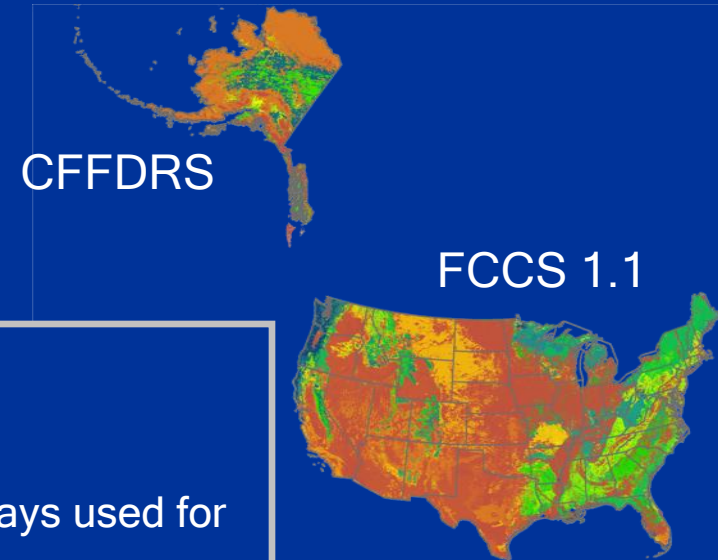
Extras

Level 0-1 FUEL AND EMISSIONS

Fuel Consumption

User Provided

GIS overlay with FCCS 1.1 (lower 48)
or CFFDRS (Alaska)



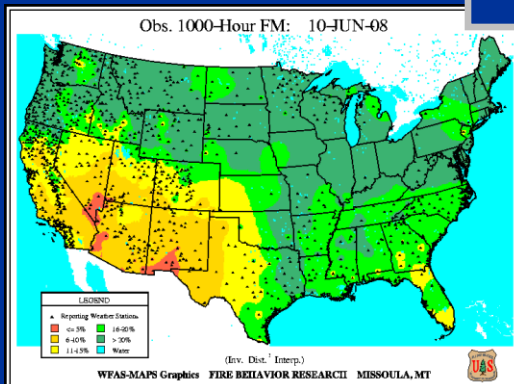
Emission Estimates

User Provided

WRAP Phase II (simple) [always used for
Regional Coordination]

CONSUME 3.0 [includes GIS lookup of daily
fuel moisture and precipitation]

1k-hr Fuel Moisture
Interpolated surface



Integration of WRAP Fire Policy Elements

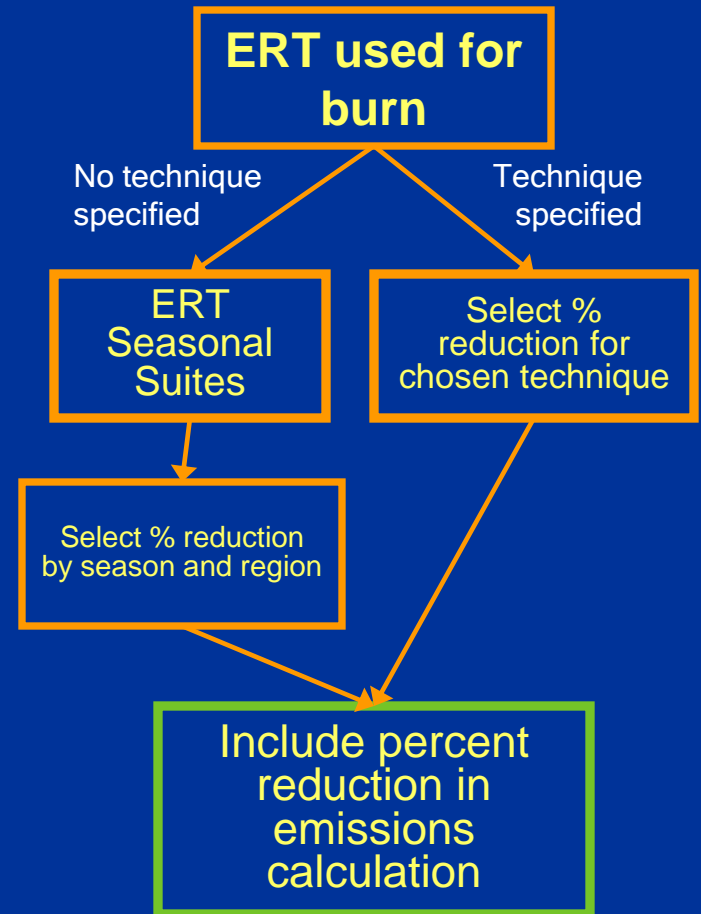
Natural/Anthropogenic
Emission Reduction Techniques

Fire Science in the FETS

Emission Reduction Techniques

- Post-burn confirmation to include ERT information and emissions averted calculation.
 - Interface to assist website users with selecting appropriate ERTs.
 - WRAP ERT Technical Package will be available as a reference for users.
- QC'd EIs will include emissions averted estimates.

Auto-selection of ERFs in FETS

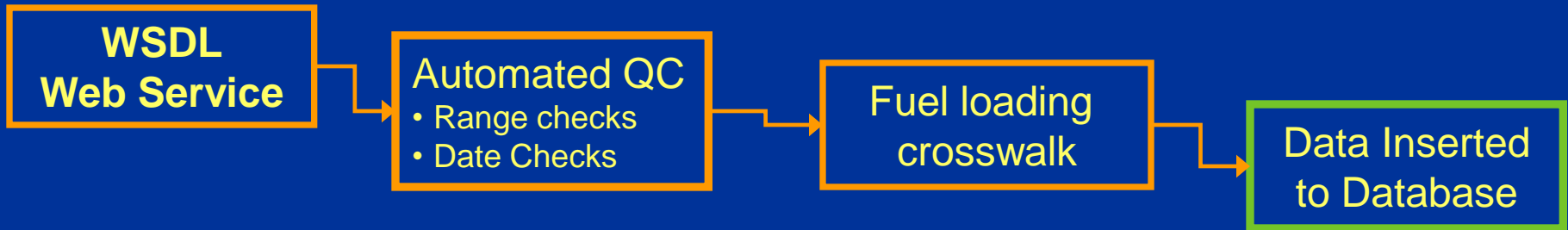


Fire Science in the FETS

Emissions Estimates

- Emissions Estimates - hierarchy
 1. User-Provided
 - When available, will always be used for emission inventories.
 2. CONSUME
 - Used for emission inventories when User-Provided data is not available.
 3. WRAP-method
 - **Always used for regional coordination map displays.**

MT/ID Airshed Group Data Acquisition



- **Preseason Burn Data**
 - Uploaded daily as they become available
 - Data associated with permits only
- **Proposed Burn Data**
 - Uploaded Daily (2 AM)
 - AP-42 style emissions estimate
- **Completed Burn Data**
 - Uploaded weekly (Sunday)
 - All data from event updated to reflect any changes
 - User-supplied emissions data added