



A summary of 2016 beta release for wildland fires, prescribed and agricultural burns for USA and outside USA; last minute changes

YEAR 2016 EMISSIONS MODELING PLATFORM PURPOSES

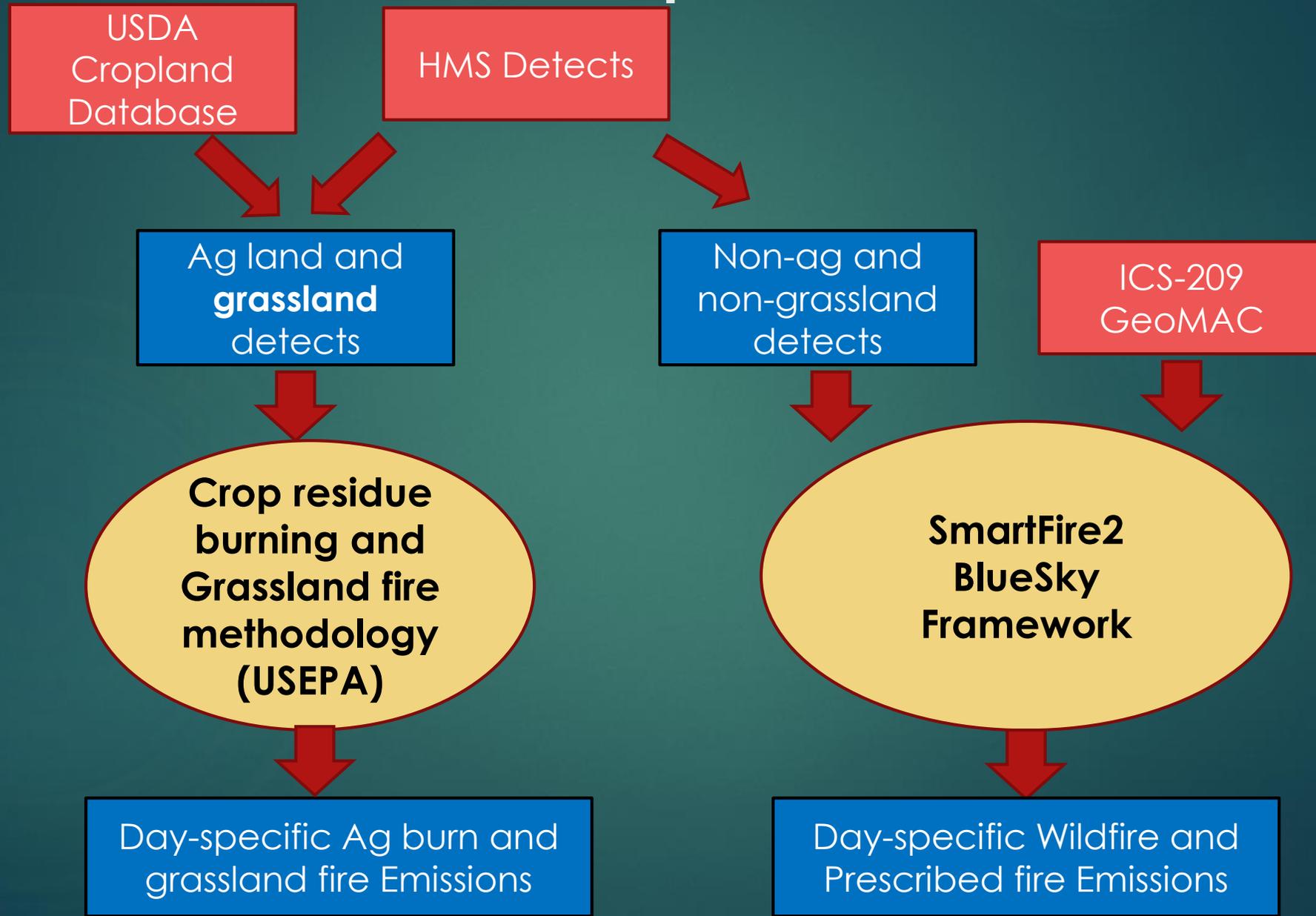
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Outline

- ▶ Summarize states, tribes, and other agencies submitted data (voluntary)
- ▶ Other national fire information used
- ▶ Last minute change involving national fire information database
- ▶ International fires (Canada and Mexico)
- ▶ Next steps towards 2016v1

Fire Emissions Processing at High-Level for non-NEI year 2016 alpha



Types of fire information accepted by SmartFire2

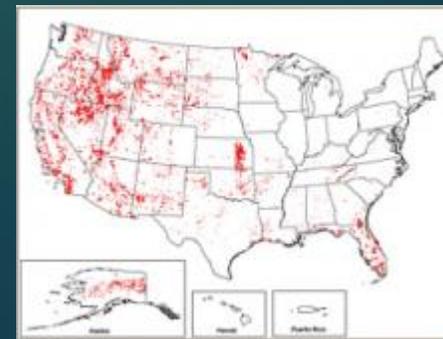
- ▶ Shapefiles: spatial extent of fire, time period, acres, start time and end time
- ▶ Comma-delimited files: latitude-longitude, time period, acres, start time, end time

National or Federal databases available for use in fire emissions modeling

Dataset Name	Fire Types	Format	Agency	Coverage
HMS	WF/RX	CSV	NOAA/EPA	North America
GeoMAC	WF	SHP	USGS	Entire US
ICS-209	WF/RX	CSV	Multi	Entire US
NASF	WF	CSV	Multi	Participating US states
MTBS	WF/RX	SHP	Multi	Entire US
FACTS	WF/RX	CSV,SHP	USDA/UFS	Entire US
USFWS	WF/RX	CSV	USFWS	USFWS lands
NFPORS	RX	CSV	DOI	Federal lands

Monitoring Trends in Burn Severity (MTBS)

- ▶ **Monitoring Trends in Burn Severity (MTBS)** is an interagency program (USGS and USDA Forest Service) whose goal is to consistently map the burn severity and extent of large fires across all lands of the United States from 1984 to present. This includes all fires 1000 acres or greater in the western United States and 500 acres or greater in the eastern United States. The extent of coverage includes the continental U.S., Alaska, Hawaii and Puerto Rico.
- ▶ Aug 3, 2018: MTBS released 1,337 new fires to MTBS.gov bringing the total number of fires mapped by the project to 21,673. This data release contains all 2016 fires.
- ▶ **National - Burned Area Boundaries Dataset:** The burned area boundaries dataset is a vector polygon ESRI shapefile of the extent of the burned areas of all currently completed MTBS fires for the continental United States, Alaska, Hawaii and Puerto Rico.
- ▶ <https://www.mtbs.gov/direct-download>



Monitoring Trends in Burn Severity (MTBS)

- ▶ New Fire Type Added to MTBS Data Record (April 16, 2014)
 - ▶ <https://www.mtbs.gov/articles/announcement/new-fire-type-added-mtbs-data-record-april-16-2014>
 - ▶ Historically, all fire types were assumed to be **wildfire (WF)** unless they were specifically reported as a **prescribed fire (RX)** or **wildland fire use (WFU)** in the original source data. Since discovered fires had no original source data these fires fell into the default WF fire type category resulting in skewed reporting for the WF fire type.
 - ▶ Over time, the cumulative impact of including discovered fires in the WF acreage has reached a point where it needed to be addressed. **To correct this over-reporting the MTBS project has added a new fire type called unknown (UNK).** The fire type associated with discovered fires has been changed to UNK throughout the MTBS data record (1984-2012) and will be reported as such in future data releases.
- ▶ “Fires of **unknown type** in that region (KS and OK) are prime candidates for **exclusion from MTBS-based analyses of wildfire activity**” from *Sources and implications of bias and uncertainty in a century of US wildfire activity data* by Karen C. Short (USDA Forest Service)

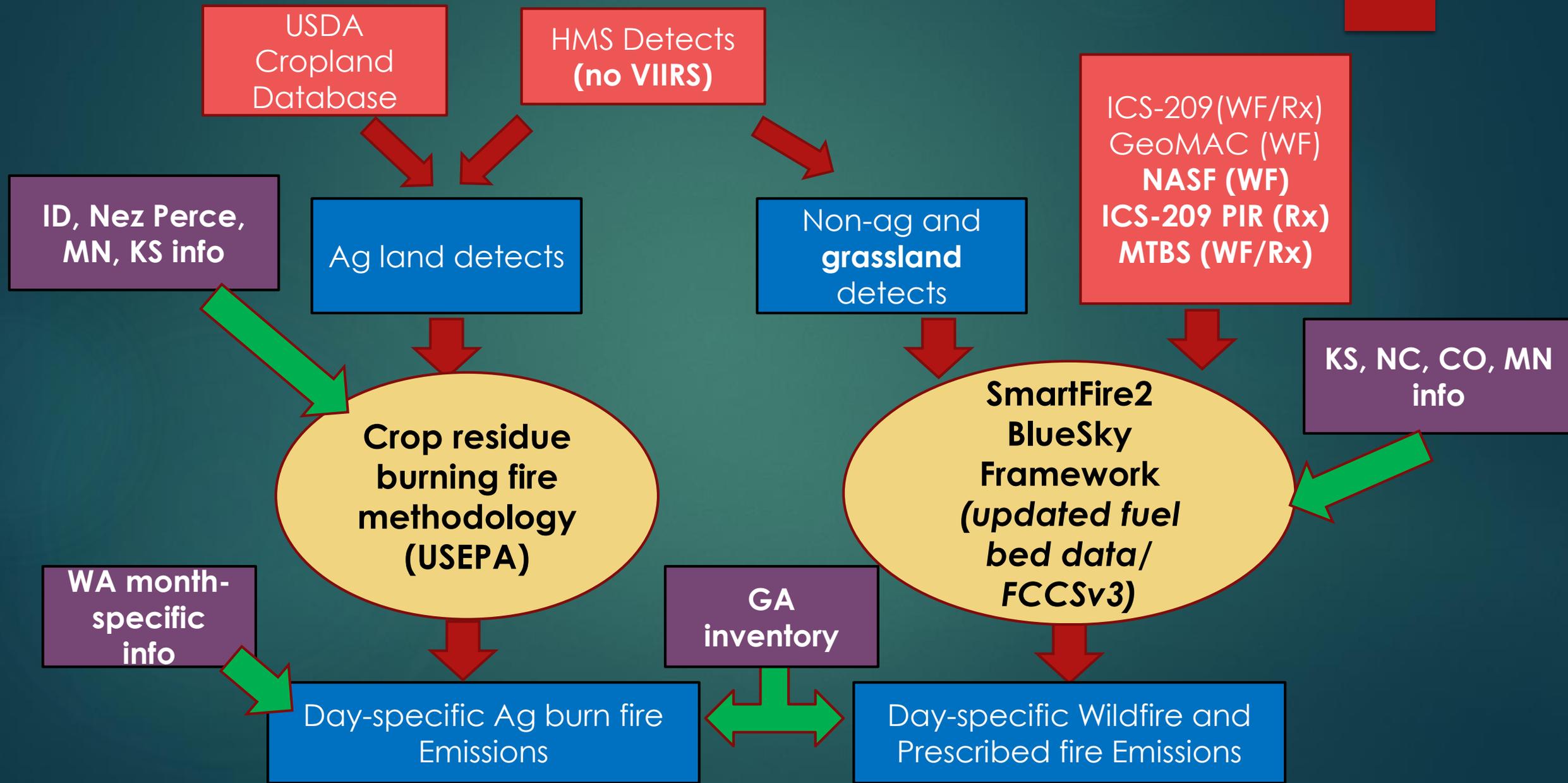
Last minute change to 2016beta: Remove MTBS Unknown “fires”

MTBS 2016		MTBS 2016	
Fire type	Millions of acres	UNK	Millions of acres
WF	3.85	KS	1.52
RX	0.74	OK	0.44
UNK	1.99	Rest	0.03
TOTAL	6.58		1.99

State-submitted fire information datasets used in 2016beta

Dataset Name	Fire Types	Format	Contact	Agency
NC	WF/RX	CSV	R. Strait	NC DENR
KS	RX/AG	CSV	J. Prentice	KSDAQ
CO	RX	CSV	C. Campbell	CO Smoke Mgmt Program
ID	AG	CSV	S. Strachan	Idaho DEQ
Nez Perce Tribe	AG	CSV	M. Fauci	Nez Perce Tribe
GA	ALL	EIS	T. Zeng	GA DNR
MN	RX/AG	CSV	T. Wickman and MN	MN
WA	AG	CSV	F. Herron-Thorpe	WA ECY

Fire Emissions Processing at High-Level for 2016 beta



Final 2016 beta national totals

- ▶ Total acres burned ~ 19M (2016alpha ~ 25.5M)
 - ▶ Wildfire acres burned = 5.6M (NIFC has ~5.5M total, 2016alpha ~ 5.7M)
 - ▶ Prescribed burn acres = 11.3M (2016alpha ~ 15.5M)
 - ▶ Ag burn acres ~ 2M (2016alpha ~ 4.4M)
- ▶ “Urban” acres burned ~ 0.5M (2016alpha ~ 3M+)
- ▶ Total emissions (WF and Rx)
 - ▶ PM2_5 = 1.75M tons (2016alpha ~ 3.2M tons)
 - ▶ VOC = 4.7M tons (2016alpha ~ 9M tons)
 - ▶ NOX = 290K tons (2016alpha ~ 440K tons)
- ▶ Ag burn emissions
 - ▶ PM2_5 = 25K tons, VOC=19K tons, NOX=11k tons

International Fire inventory

- ▶ Fire Inventory from NCAR (FINN) global dataset
 - ▶ Recently discovered leap-year error (Feb 29-Dec 31 fires displaced one day)
 - ▶ FINN author corrected this error and EPA verified (in beta release)
 - ▶ FINN used for Mexico for all of 2016 and for some months in Canada
- ▶ Environment Canada inventory
 - ▶ Year 2016 inventory with some missing winter months
 - ▶ Use FINN to fill in missing time periods
 - ▶ Fort McMurray fire (1.5M acres; May-Aug)
- ▶ More analysis of these inventories in coming months

List of Possible Improvements for 2016v1

- ▶ National fire information datasets
 - ▶ Forest Service Activity Tracking System (FACTS) data from the USFS-USDA
 - ▶ WF and Rx fire info/shapefiles
 - ▶ US Fish and Wildlife Service database
 - ▶ WF and Rx fire info
 - ▶ National Fire Plan Operations and Reporting System (NFPORS) database from Dept of Interior
- ▶ More state-submitted data or changes
- ▶ Examine fuels defined as “Urban” (documentation indicates = urban, barren, and agriculture): dropping MTBS UNK fires resulted in 10% more reduction in “Urban” fires in 2016beta
- ▶ Examine use of MODIS Collection 6 detects
- ▶ Possible interaction with USFS-AIRFIRE team and their latest BlueSky software tools?