Fire Issues in a Global Context

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with acknowledgments
Mr. Justin Fain, Geospatial Coder

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Fire as a tool

Open burning by farmers and pastoralists:

1. “Clear the land”
2. To control vermin, pests, and plant diseases
3. Fresh pasture (fire-adapted grass re-seeding)
4. Cultural practice

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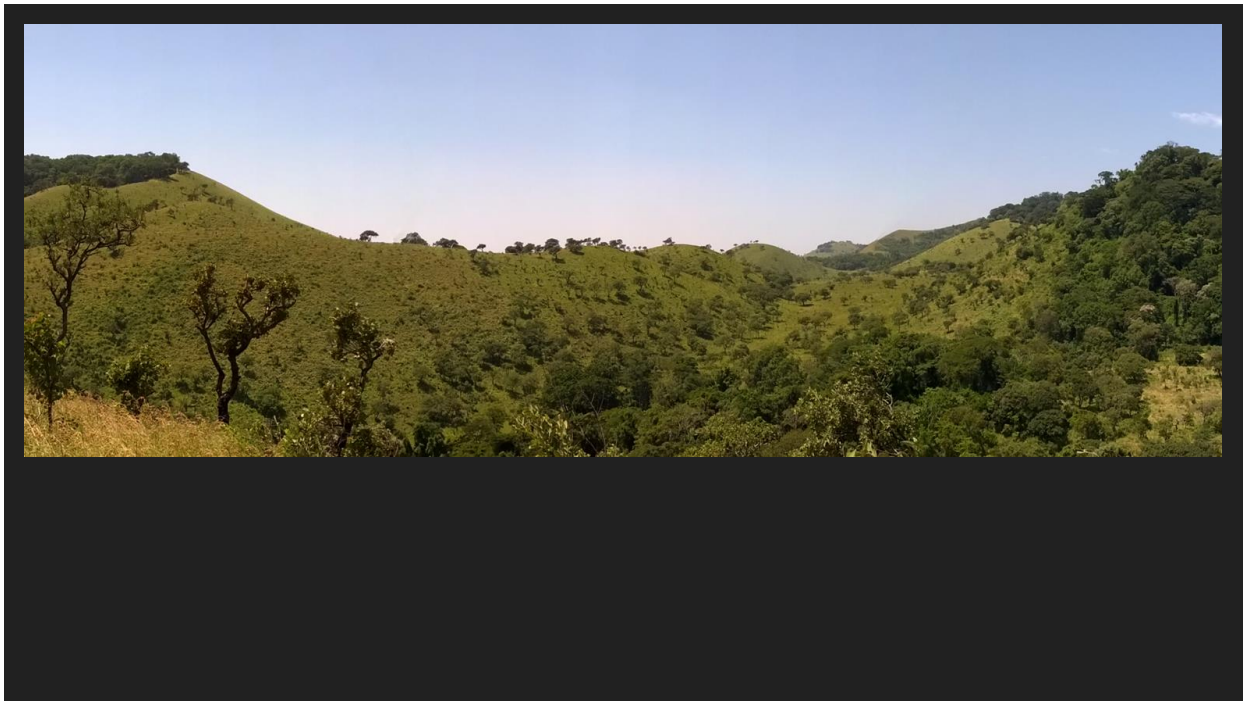

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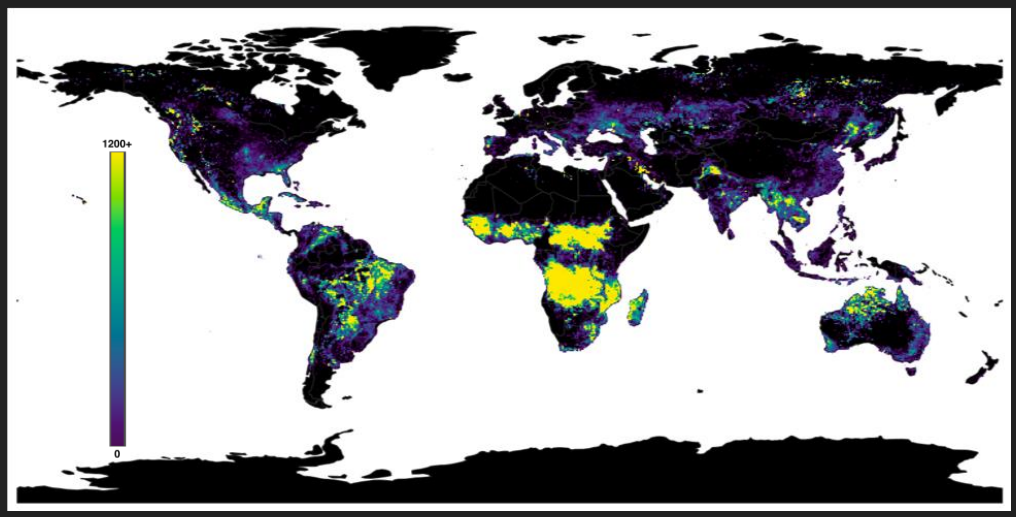
Global Open Burning: VIIRS Fire Density, 2016



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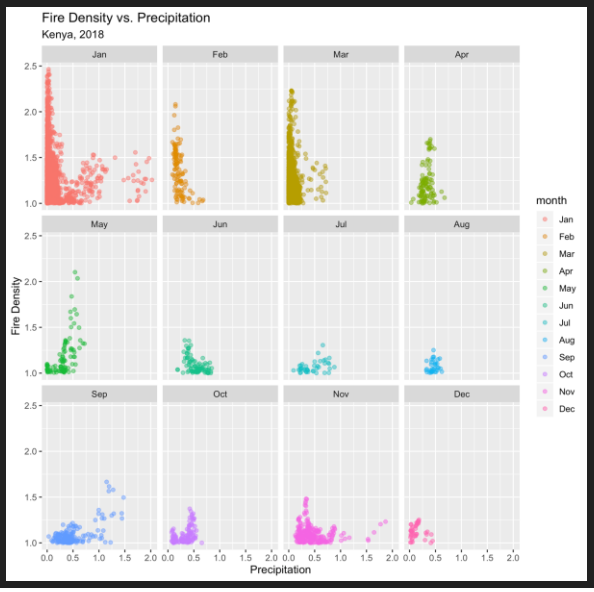
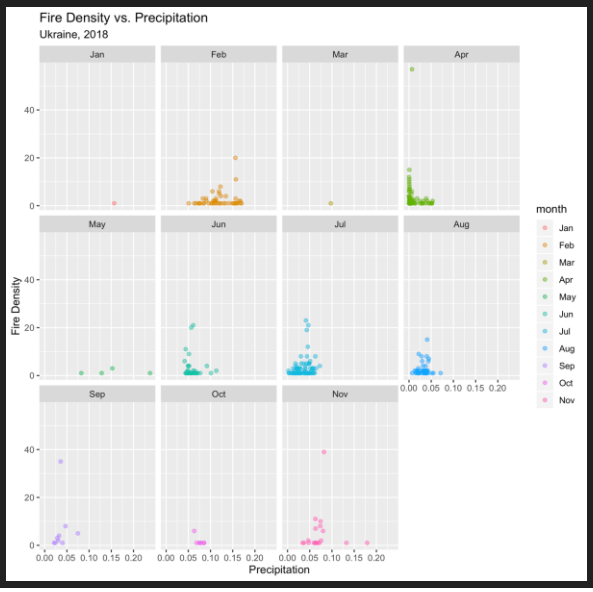
Burning When Wet - Not All Fires Are Wildfires





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Comparing Open Burning Across UNECE

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Open Burning in Ukraine, 2012 - 2018

“Cropland-only fire counts	544,631
Total fire counts	760,879
Percent agricultural burns	71.2

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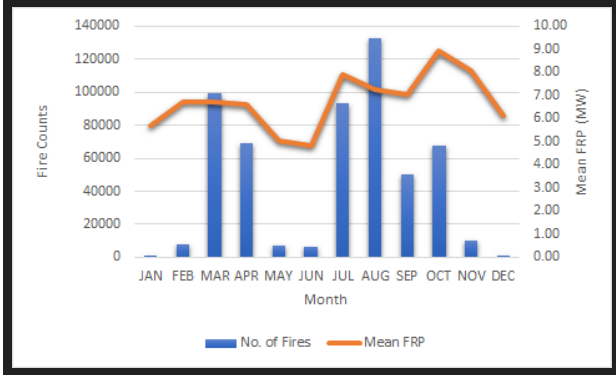
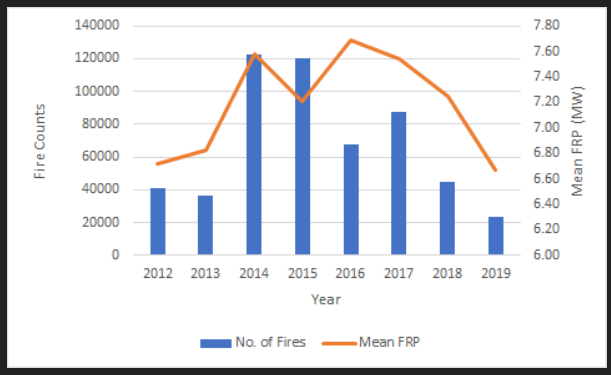
Ukraine





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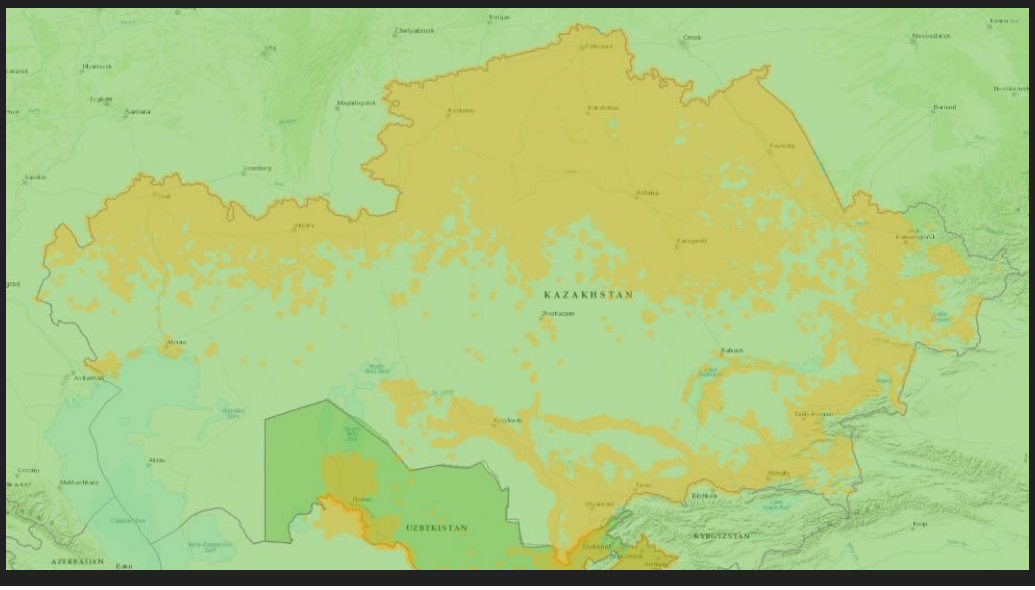
Agricultural Burns in Kazakhstan, 2012 - 2018



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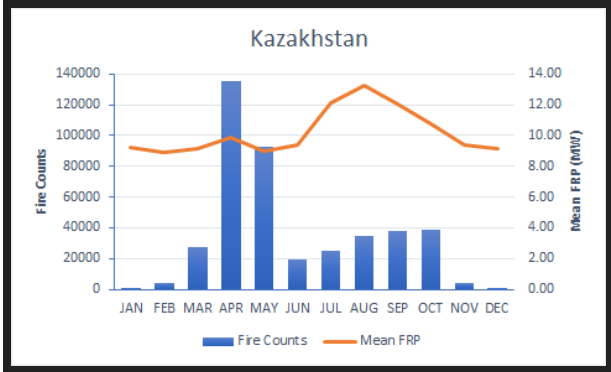
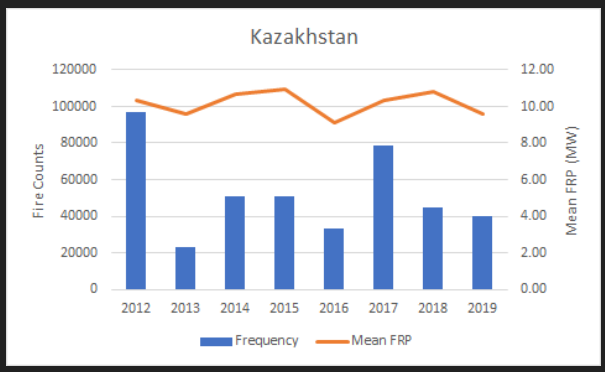
Kazakhstan





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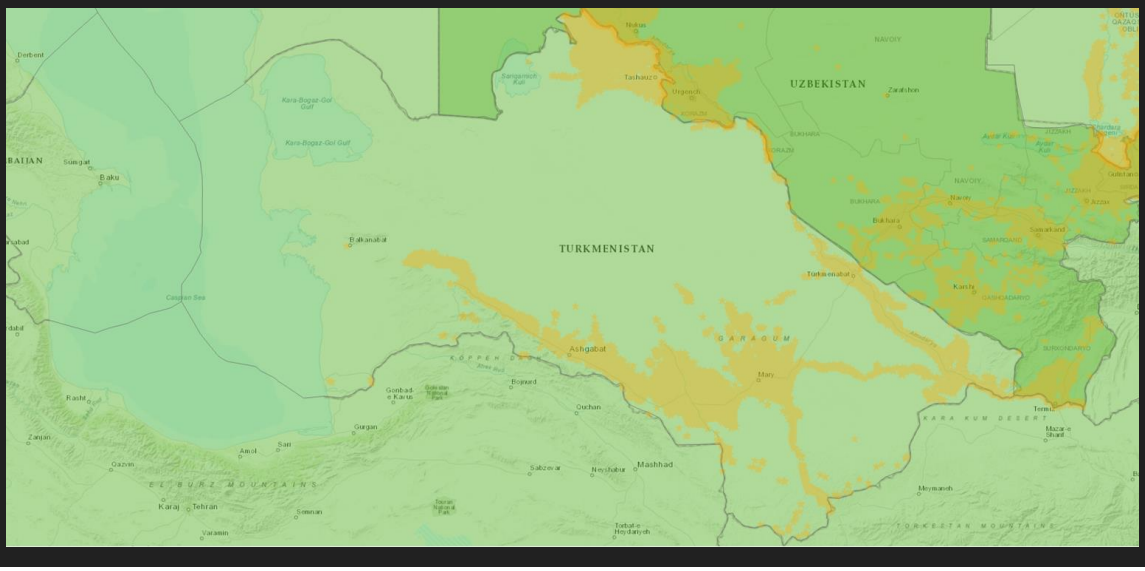
Turkmenistan Agricultural Burning, 2012 - 2018



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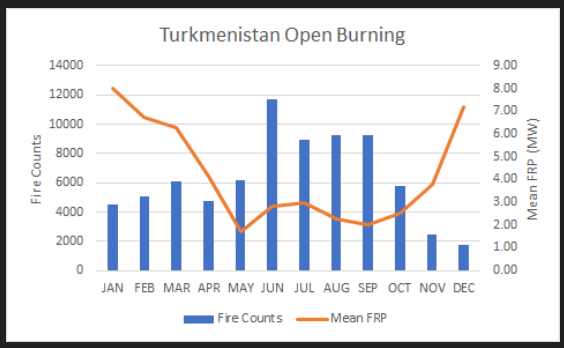
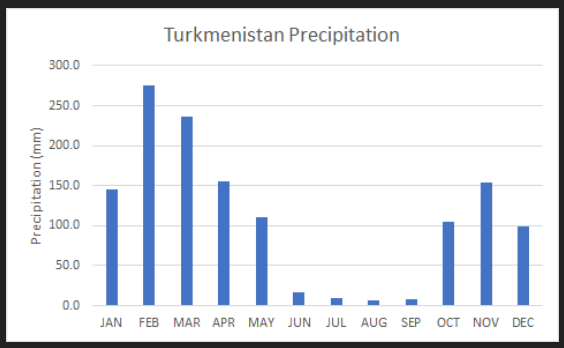
Turkmenistan, 2012-2018 VIIRS active fires





Open burning occurs throughout the year but peaks in the dry season.

Mean annual precipitation of burned areas is 188.5 mm

Cropland-only Fires	75,000
Total Fires	180,768
Percent Agricultural	41.9
Mean FRP (MW)	3.62

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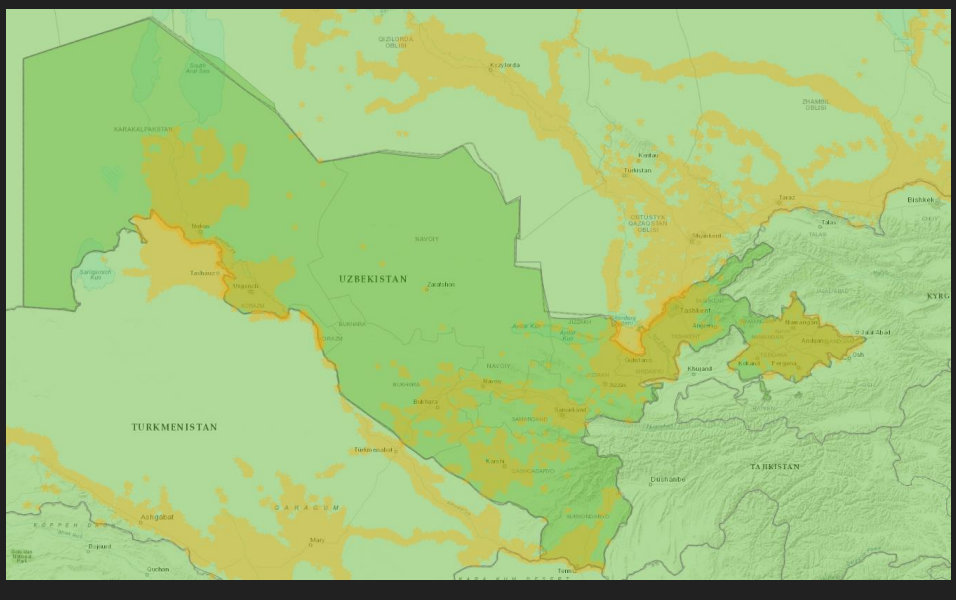
Uzbekistan Agricultural Burning, 2012 - 2018



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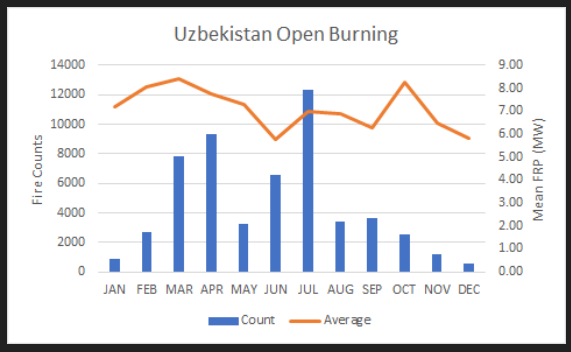
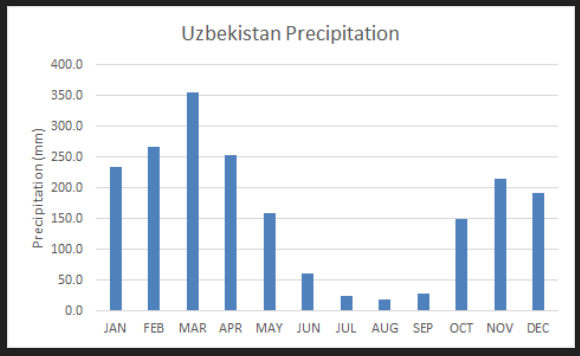
Uzbekistan





Mean annual precipitation of burned areas is 279.6 mm

Agricultural burning also occurring in the wet season

Cropland-only Fires	54,163
Total Fires	142,969
Percent Agricultural	37.9
Mean FRP (MW)	7.23

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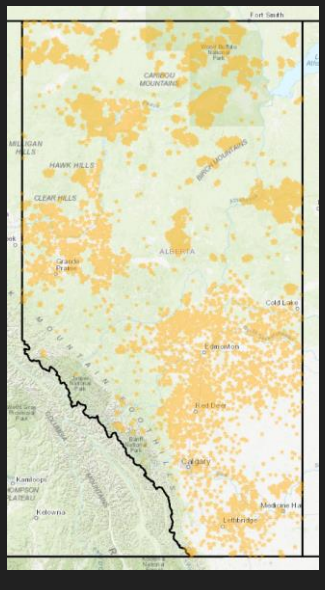
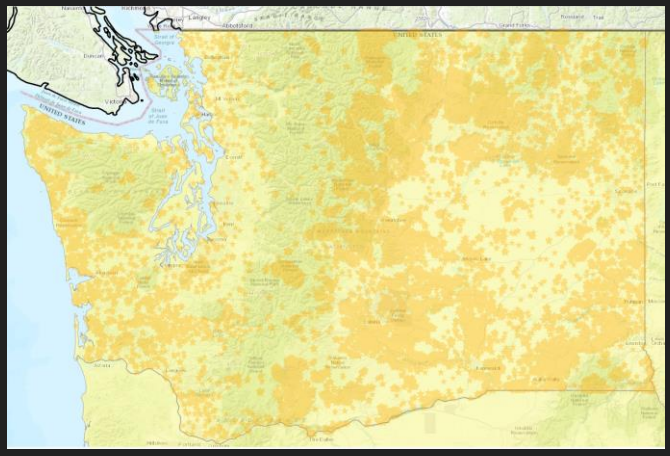
Case Study: Canada and United States





Washington State vs. Alberta

More fire in the U.S. than Canada, but both show decrease

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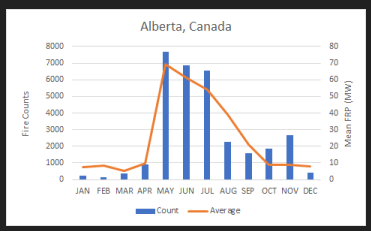
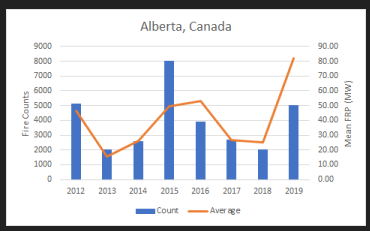
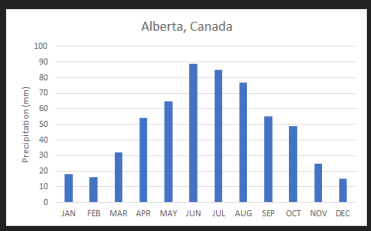
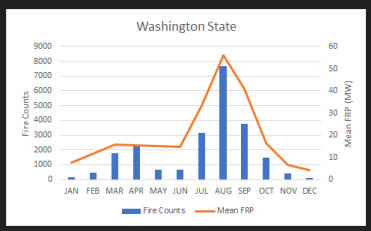
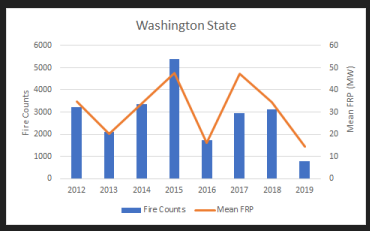
Open burning: Alberta vs. Washington State

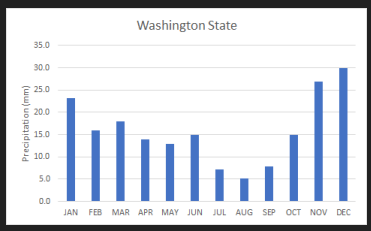












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Alberta vs Washington State

	Alberta	Washington
Cropland-Only Fires	31,606	22,607
Total Fires	304,533	166,327
Percent Agricultural	10.4	13.6
Mean FRP (MW)	47.1	35.8

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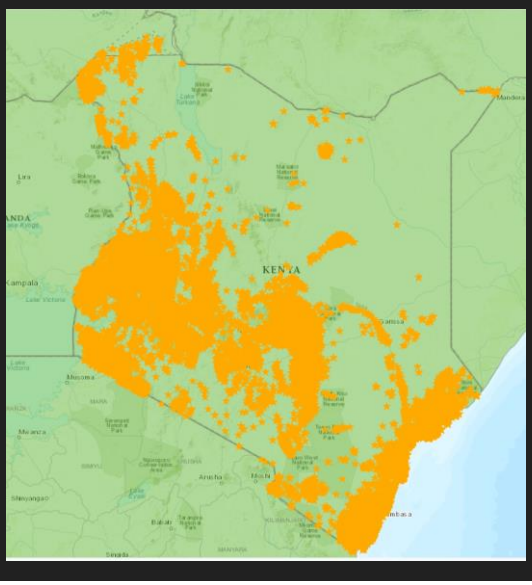
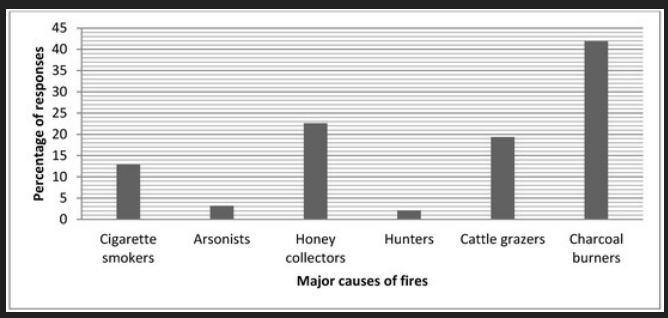
Kenya Agricultural Open Burning





Nyongesa and Vacik, 2019: https://www.mdpi.com/1999-4907/9/8/481

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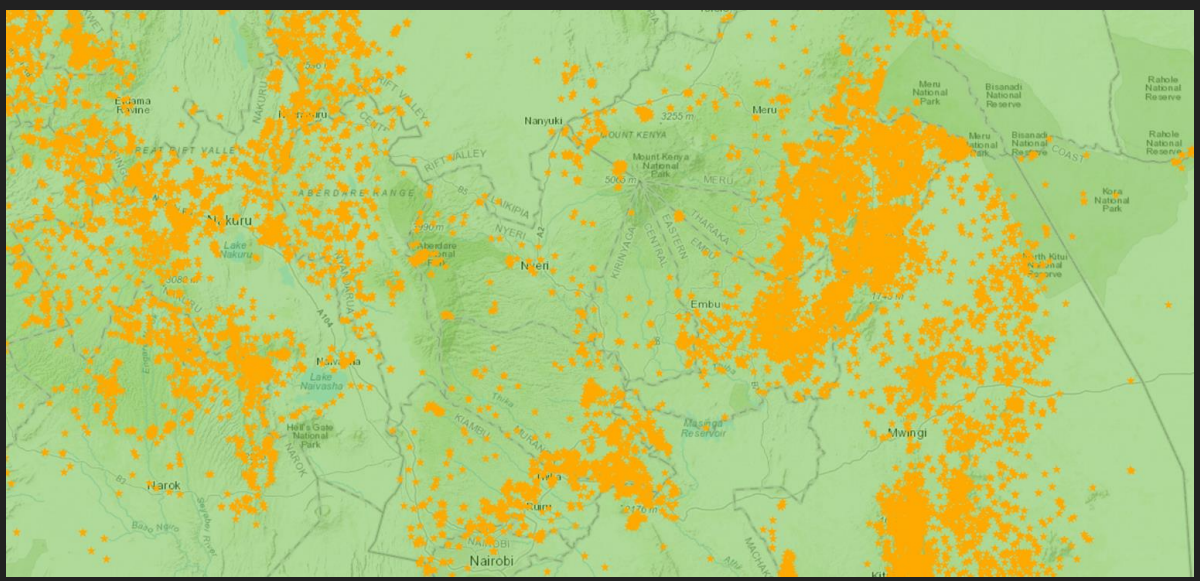
Agricultural Burning in Drier Regions of Kenya



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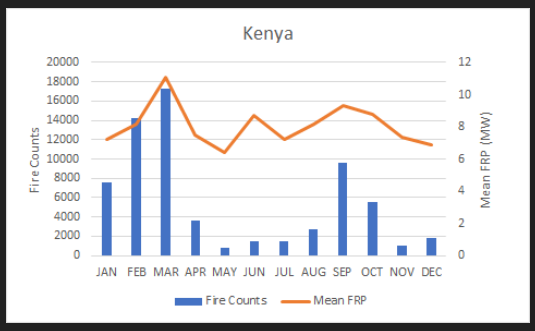

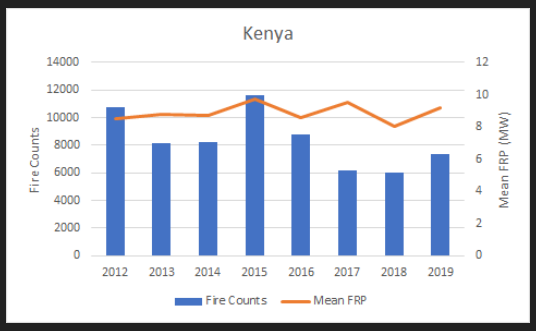

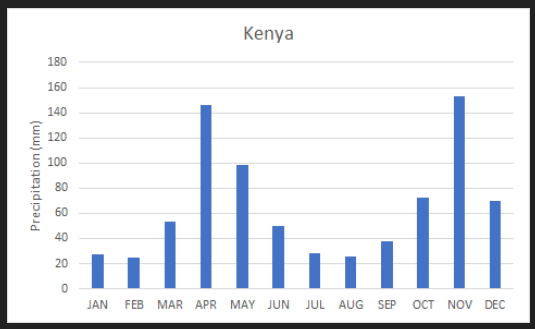

Cropland-Only Fires	55,725
Total Fires	155,038
Percent Agricultural	35.9
Mean FRP (MW)	8.92

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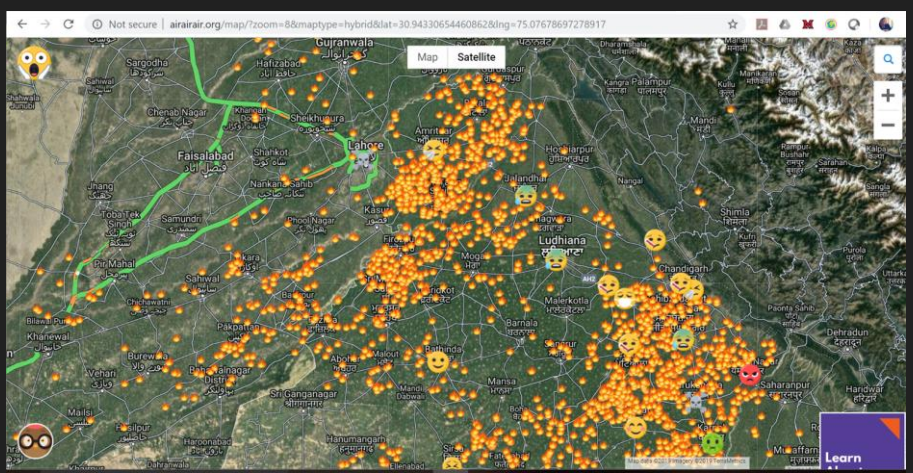
Case Study: India



hindustantimes

UN experts visit three stubble burning-free villages in Amritsar

UN-PAU PROJECT Villages adopted for not burning crop residue

hindustantimes stop stubble fires

Staff Correspondent

AMRITSAR: Experts from United Nations Environment Programme (UNEP) and the Food and Agriculture Organisation (FAO) on Thursday visited three villages of the district which were declared as stubble burning-free and adopted under 'Climate and Clean Air Coalition' (CCAC) projects year ago.

This is a joint project of UNEP, CCAC and Punjab Agricultural Management and Extension Training Institute (PAMETI), PAU, Ludhiana. Rajiana, Bhawal and Qilampur villages were adopted under the project as its farmers do not indulge in burning of crop residue in their fields and use eco-friendly methods.

The experts observed a live demonstration of combine harvester having straw management system (SMS) technology, PAU straw cutter-cum-spreader, MB plough and Happy seeder.

The experts included Dr Amir Kassam, a professor from UK and FAO consultant, Prof Yuji Niira, a scientist from Japan working with FAO in Thailand and Dr Jessica McCarty, professor of Miami University of US.

FARM FIRE TRACKER

Cases reported on Thursday 248

TOTAL THIS SEASON 1,631

A team of the United Nations with farmers at Rajiana village in Amritsar on Thursday.

NODAL OFFICERS IN 8,000 VILLAGES TO CHECK FARM FIRES

CHANDIGARH: The Punjab government has decided to depute nodal officers in nearly 8,000 paddy growing villages across the state where paddy stubble is traditionally being burnt.

Agriculture and farmers welfare secretary Kahan Singh Pannu said the deputy commissioners had been asked to depute the officers/officials in each of these villages to create awareness about the ill effects of stubble burning on human health and environment. These nodal officers have been asked to keep a close vigil over the post harvesting operations.

The agriculture secretary said the staff of cooperation, revenue, rural development and panchayats, agriculture, horticulture, soil conservation and power departments would work in tandem to check this menace. The nodal officers will also undertake various activities, ranging from holding meetings with the farmers and, arranging Crop Residue Management (CRM) machines to distribution of pamphlets, leaflets in villages, besides making announcements in gurdwaras. "If any farmer burns the residue in the open fields, the nodal officers will ensure red entry in the revenue records with the help of the patwari," he said.

Pannu said that all the secretaries of 1,481 cooperative societies in state would be deployed in addition to 1,880 panchayat secretaries, 2,000 junior engineers, 6,000 linemen, 100 sub-divisional officers of PSPCL, 1,500 officers of the departments of agriculture, horticulture and soil conservation. HTC

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Data Concerns

1. How do we define agroecosystems to map and intervene in open burning?
   a. 20 m ESA CCI Land Cover product: categories too broad
   b. Anthromes
1. Cloud, haze, and smoke contamination obscure active fire detection
1. Can “night lights” change detection products help?
   a. Quantifying “hidden” open burning

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Label		Value		Color
Global	Regional	Global	Regional	
No Data		0		
Cropland, rainfed		10		
	Cropland, rainfed, herbaceous cover		11	
	Cropland, rainfed, tree or shrub cover		12	
Cropland, irrigated or post-flooding		20		
Mosaic cropland (>50%) / natural vegetation (tree, shrub, herbaceous cover) (<50%)		30		
Mosaic natural vegetation (tree, shrub, herbaceous cover) (>50%) / cropland (<50%)		40		
Tree cover, broadleaved, evergreen, closed to open (>15%)		50		
Tree cover, broadleaved, deciduous, closed to open (>15%)		60		
	Tree cover, broadleaved, deciduous, closed (>40%)		61	
	Tree cover, broadleaved, deciduous, open (15-40%)		62	
Tree cover, needleleaved, evergreen, closed to open (>15%)		70		
	Tree cover, needleleaved, evergreen, closed (>40%)		71	
	Tree cover, needleleaved, evergreen, open (15-40%)		72	
Tree cover, needleleaved, deciduous, closed to open (>15%)		80		
	Tree cover, needleleaved, deciduous, closed (>40%)		81	
	Tree cover, needleleaved, deciduous, open (15-40%)		82	
Tree cover, mixed leaf type (broadleaved and needleleaved)		90		
Mosaic tree and shrub (>50%) / herbaceous cover (<50%)		100		
Mosaic herbaceous cover		110		
(>50%) / tree and shrub (<50%)				
Shrubland		120		
	Evergreen shrubland		121	
	Deciduous shrubland		122	
Grassland		130		
Lichens and mosses		140		
Sparse vegetation (tree, shrub, herbaceous cover) (<15%)		150		
	Sparse tree (<15%)		151	
	Sparse shrub (<15%)		152	
	Sparse herbaceous cover (<15%)		153	
Tree cover, flooded, fresh or brakish water		160		
Tree cover, flooded, saline water		170		
Shrub or herbaceous cover, flooded, fresh/saline/brakish water		180		
Urban areas		190		
Bare areas		200		
	Consolidated bare areas	201		
	Unconsolidated bare areas	202		
Water bodies		210		
Permanent snow and ice		220		

Climate Change Initiative Land Cover (CCI-LC) LEGEND
Global annual land cover maps available for 1992, 1995-2015 at 300 m resolution based on MERIS, FR/RR, SPOT-VEG, AVHRR, and PROB-V

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