ARM Aerial Vehicles Program

An Overview of the Cloud and Land Surface Interactions Campaign (CLASIC)

ARM Science Team Meeting
March 13th, 2008
Norfolk, VA

Jason Tomlinson
Pacific Northwest National Laboratory

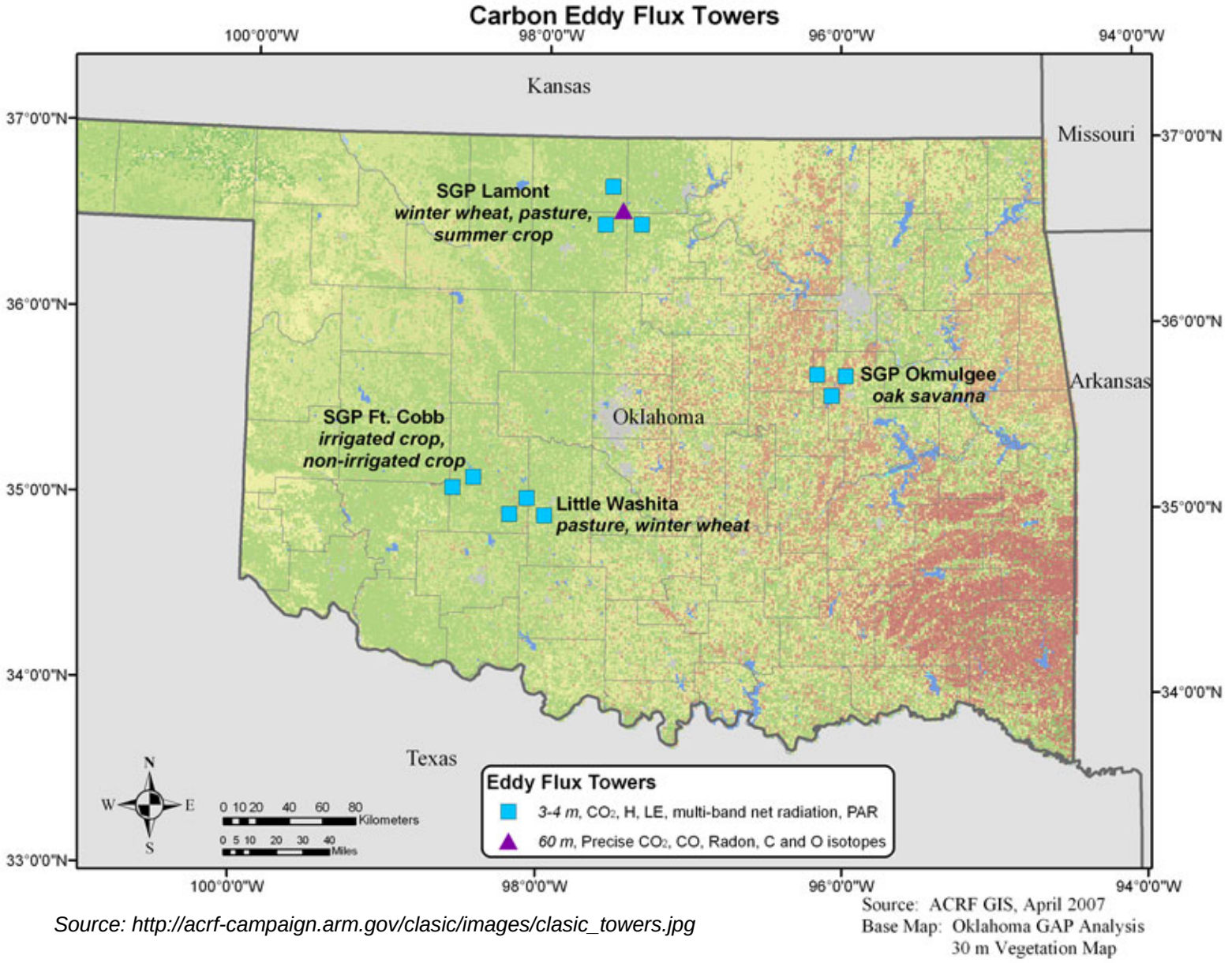
Overview

- The primary goal of CLASIC is to improve understanding of the physics of the early stages of cumulus cloud convection as it relates to land surface conditions, and to translate this new understanding into improved representations in GCMs and regional climate models

Overview

- ARM Southern Great Plains Climate Research Facility
  - June 8-July 2, 2007
- Nine participating aircraft
  - *In-situ*
    - CIRPAS Twin Otter
    - Cessna 206
    - Duke University Helicopter Observation Platform
  - Remote Sensing
    - ER-2
    - NOAA WP-3D
    - Twin Otter International
    - J-31
  - CHAPS
    - G-1
    - B-200
- Multiple Surface Super Sites

Aerial Vehicles Program

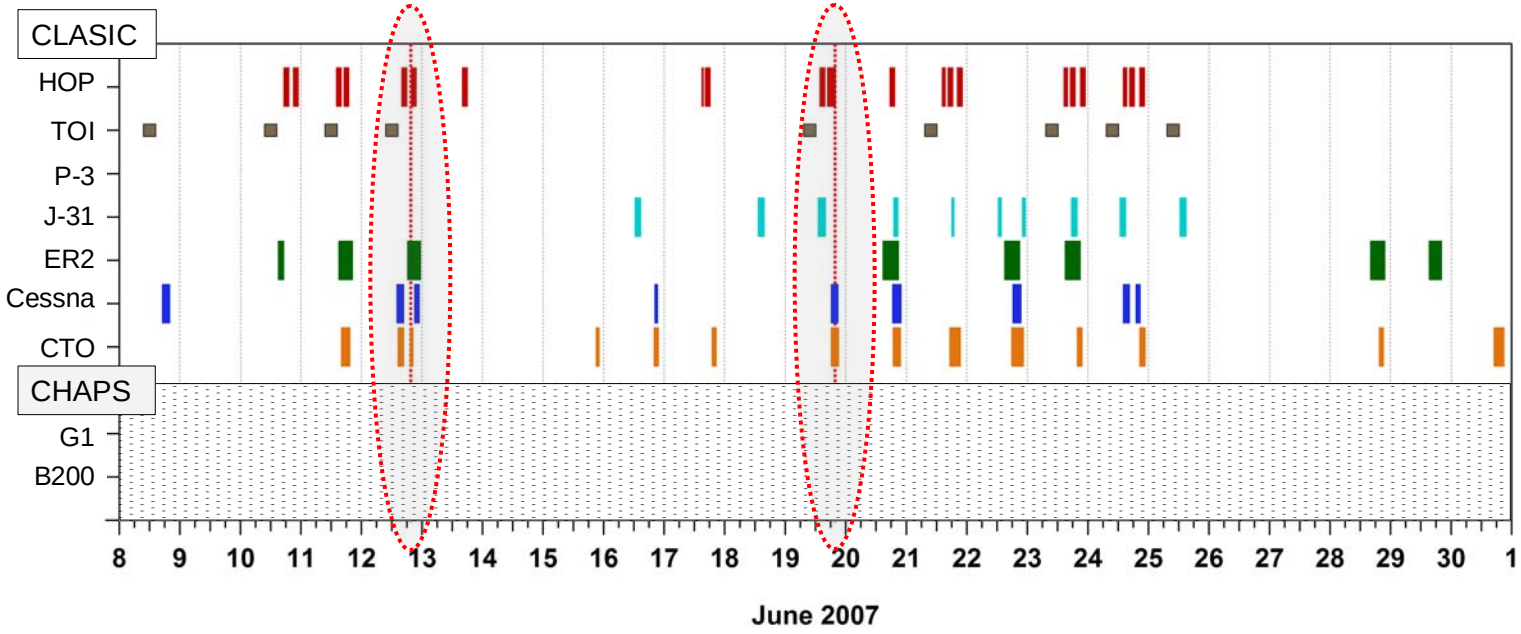


Source: http://acrf-campaign.arm.gov/clasic/images/clasic_towers.jpg

Overview

- Multiple Surface Super Sites
  - SGP Lamont, SGP Ft. Cobb, SGP Okmulgee, Little Washita
  - Measuring fluxes, meteorology, soil moisture, vegetation characteristics, and albedo
- Approximately 100 participants

Overview



Introduction
Archive
Website
WIKI

Overview

June	CTO	Cessna	HOP	ER2	J-31	P3	TOI	G1	B200
8									
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B-200

Archive

- The archive for the aircraft data is currently located on IOPSHARE
  - Have received data from 75% of the instruments aboard the aircraft platforms
- Data from ground based measurements are available from other sources
  - Microwave Radiometer Data and Radiosonde data from the SGP site are available from the ARM archive under the IOP folder

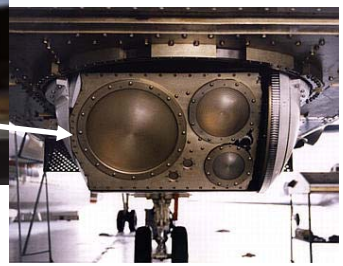
Archive

b200_hsrl	20071204 22:07
cirpas_aerosol	20080208 21:08
cirpas_cabin	20071015 20:15
cirpas_co2	20080204 21:11
cirpas_co_argus	20080210 05:00
cirpas_pdi	20071009 14:35
cirpas_radar	20071104 01:19
cirpas_tdma	20071018 15:38
collins-cirpas_ccn	20071018 15:37
er2_cloud_lidar	20080131 21:54
er2_cloud_radar	20071014 17:19
er2_mas	20080203 22:16
er2_nav	20080211 21:36
hop_fluxes	20071009 14:36
j31_car	20071009 14:36
p3_psr	20071009 14:35
toi_pals	20071009 14:35
torn-c206_carbonflasks	20071113 23:35
torn-c206_co2	20071113 23:37
torn-cirpas_carbonflasks	20071113 23:35
torn-radon	20080220 07:15
avissar-hop_fluxes	20071009 16:18
chuang-cirpas_pdi	20071009 16:16
collins-cirpas_tdma	20071009 16:16
dominguez-er2_mas	20071009 16:15
gasiewski-p3_psr	20071009 16:15
gatebe-j31_car	20071009 16:18
heymsfield-er2_cloud_radar	20071009 16:15
hostetler-b200_hsrl	20071009 16:18
jackson-toi_pals	20071009 16:17
jennison-er2_nav	20071009 16:14
jonsson-cirpas_cabin	20071009 16:15
lopez-cirpas_co_argus	20071009 16:17
mcgill-er2_cloud_lidar	20071009 16:15
ogren-cirpas_aerosol	20071009 16:16
torn-cirpas_co2	20071009 16:16
widener-cirpas_radar	20080205 16:15

Aircraft

Measurement, Task or Product	Institution	Preliminary	Final
Navigation Data	NASA		?
Cloud Radar System	NASA		?
Cloud Physics LIDAR	NASA		?
MAS	NASA		?

Aircraft



Measurement, Task, or Product	Institution	Preliminary	Final
Navigation Data	NOAA	?	?
PSR	NOAA	?	?

Aircraft

Introduction
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Measurement, Task, or Product	Institution	Preliminary	Final
Navigation Data	NASA	?	?
CAR	NASA	?	?

Aircraft

Measurement, Task, or Product	Institution	Preliminary	Final
Navigation Data	JPL/USDA	?	?
PALS	JPL/USDA	?	?

Aircraft

Measurement, Task, or Product	Institution	Preliminary	Final
Navigation Data	CIRPAS		?
Aerosol and cloud	CIRPAS		?
Phased Array Radar	CIRPAS		?
Aerosol scattering and absorption	NOAA		?
Cloud particle size distribution	UCSC	?	?
CCN Conc. and Aerosol Hygroscopicity	TAMU		?
CO2, Radon, Trace Gases	LBL		?
ARGUS (CO,CH4,N2O)	BAERI/NASA		?

Aircraft

Measurement, Task, or Product	Institution	Preliminary	Final
Navigation Data	Duke	?	?
Fluxes	Duke	?	?

Aircraft

Measurement, Task or Product	Institution	Preliminary	Final
Navigation Data	NOAA	?	?
Aerosol Properties	NOAA		?
CO2, Radon, Trace Gases	LBL		?

Other Aircraft

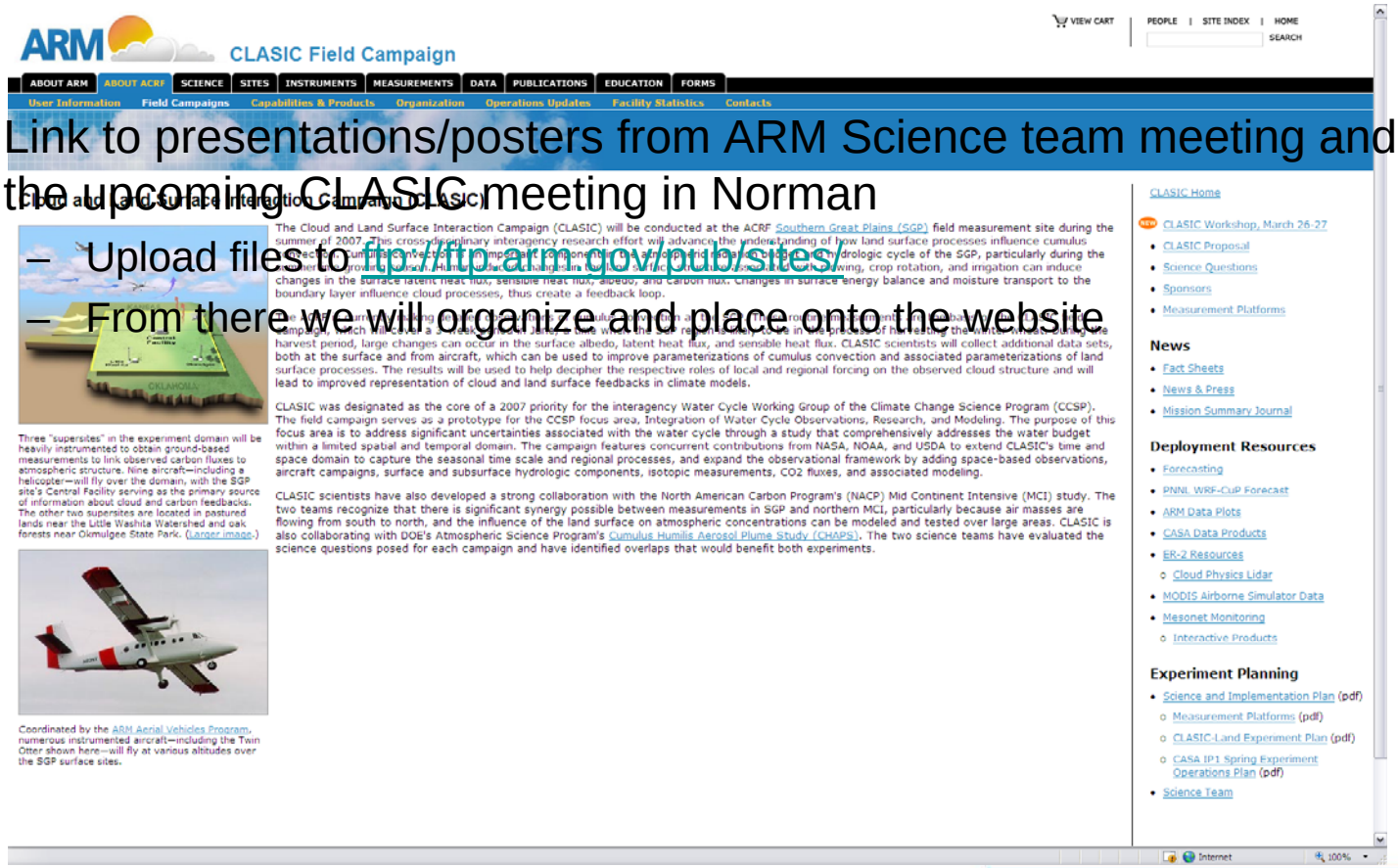
HSRL

Aerosol, cloud, and gas phase measurements

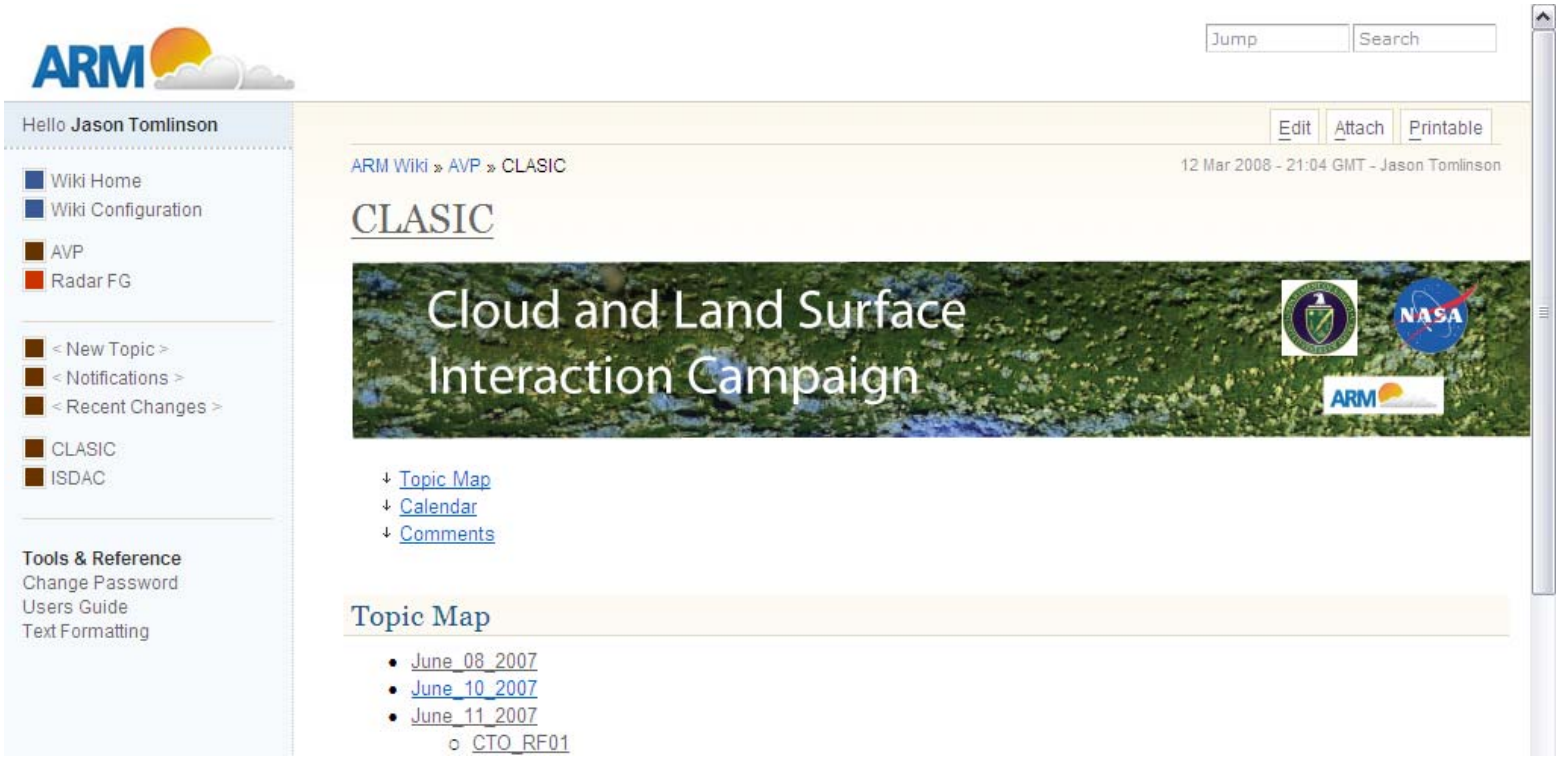
- Collaboration potential with the aircraft that participated in the Cumulus Humilis Aerosol Processing Study (CHAPS).

Website Development

- Link to presentations/posters from ARM Science team meeting and the upcoming CLASIC meeting in Norman
  - Upload files to ftp://ftp.arm.gov/pub/sites/
  - From there we will organize and place onto the website



Wiki Development



Wiki Development

Topic Map

- June_08_2007
- June_10_2007
- June_11_2007
  - CTO_RF01
- June_12_2007
  - CTO_RF02
- June_13_2007
- June_15_2007
- June_16_2007
- June_17_2007
- June_18_2007
- June_19_2007
- June_20_2007
- June_21_2007
- June_22_2007
- June_23_2007
- June_24_2007
  - CLASIC_CTO_RF12
- June_25_2007
- June_28_2007
- June_29_2007
- June_30_2007

Wiki Development

- June_29_2007
- June_30_2007

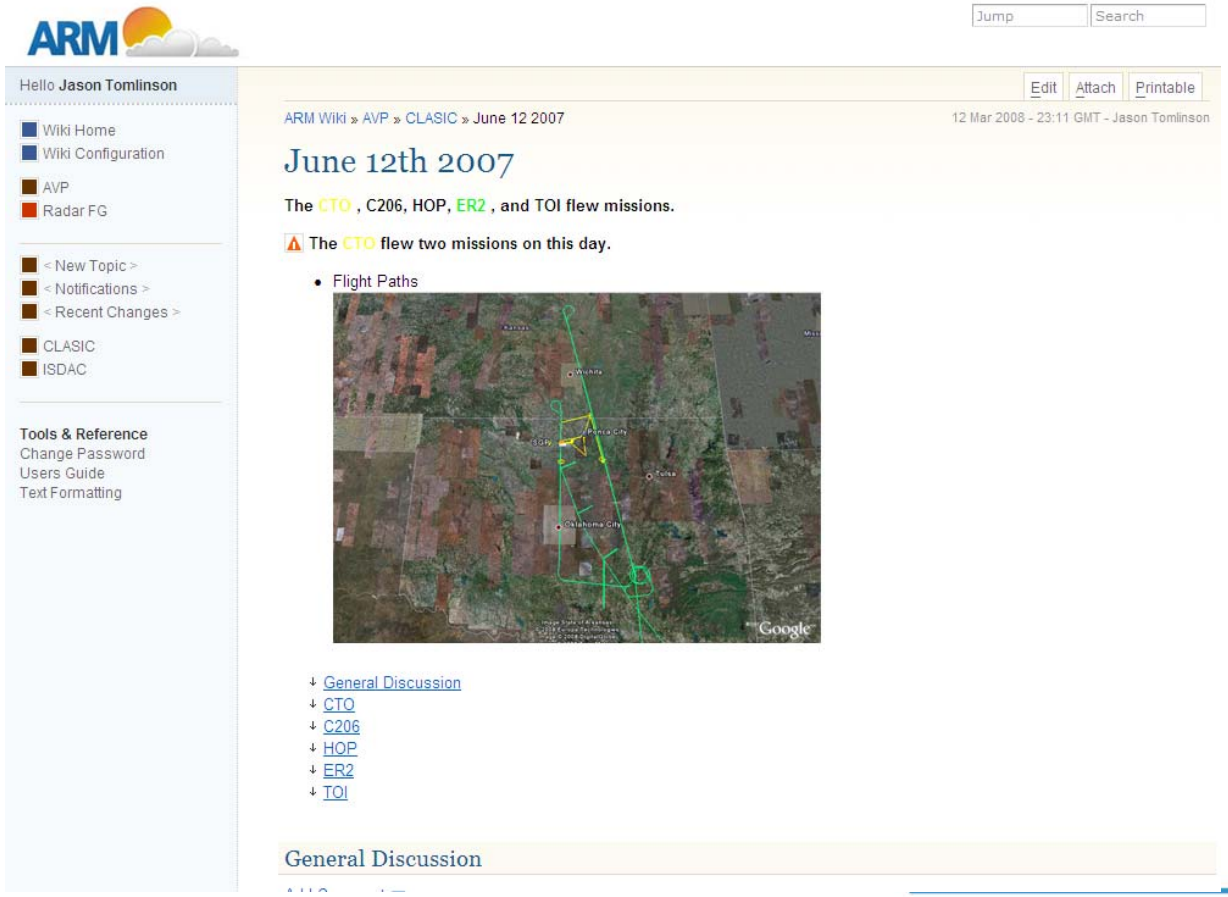
Calendar

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5	6	7	8 C206, TOI	9 HOP, ER2, TOI
10 HOP, ER2, TOI	11 CTO,HOP, ER2, TOI	12 CTO, C206, HOP, ER2, TOI	13 HOP	14	15 CTO	16 CTO, C206, J-31
17 CTO, HOP	18 J-31	19 CTO, C206, HOP, J-31, TOI	20 CTO, C206, HOP, ER2, J-31	21 CTO, HOP, J-31, TOI	22 CTO, C206, ER2, J-31	23 CTO, C206, ER2, J-31
24 CTO, C206, HOP, J-31, TOI	25 J-31, TOI	26	27	28 CTO, ER2	29 ER2	30 CTO

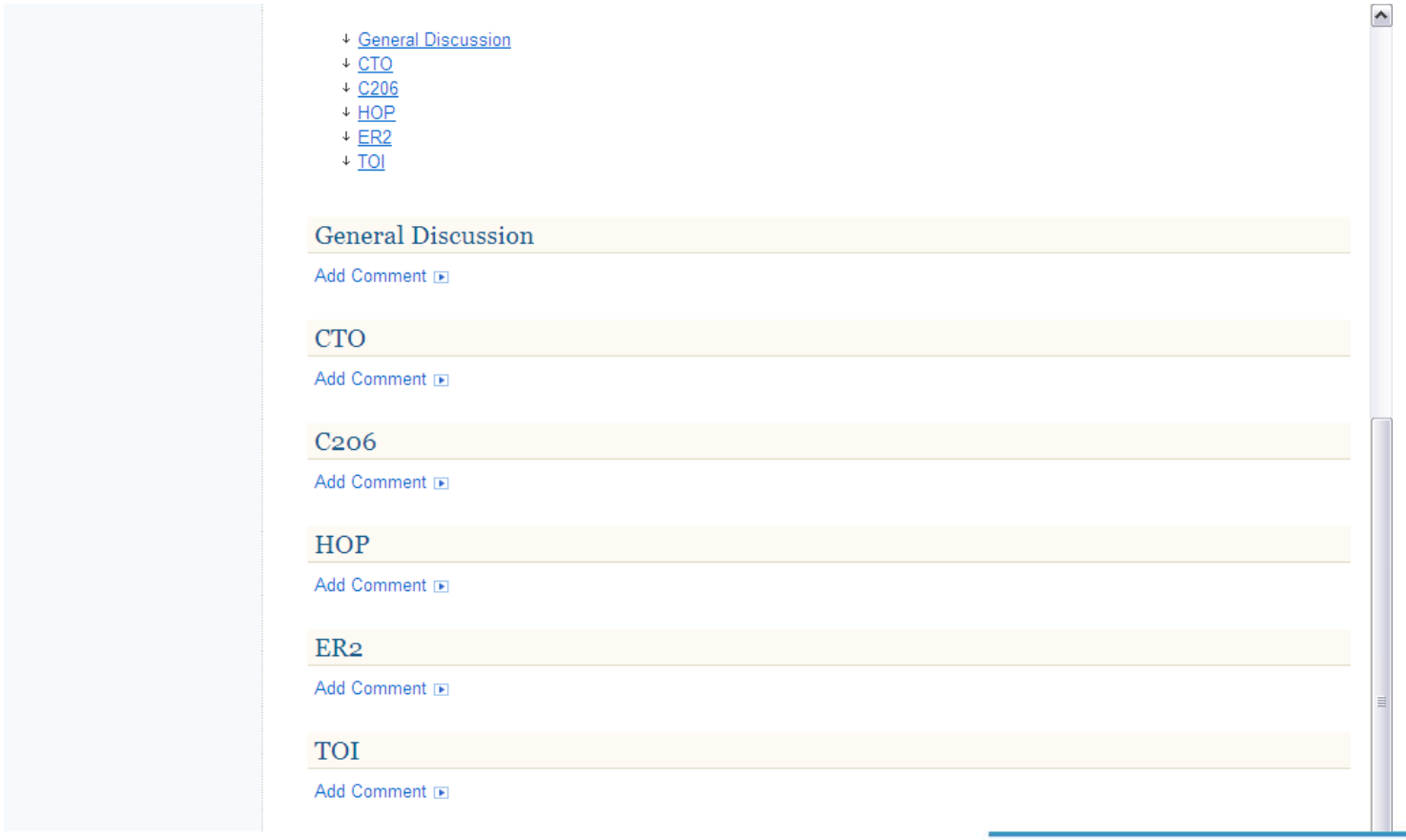
Comments

Add Comment

Wiki Development



Wiki Development



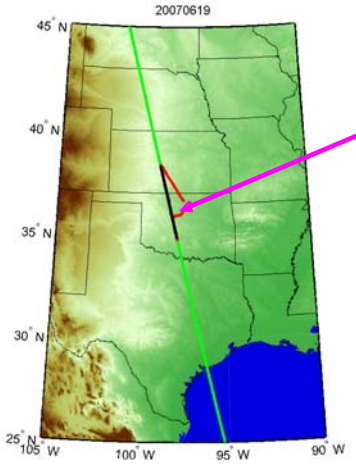
Any Questions?

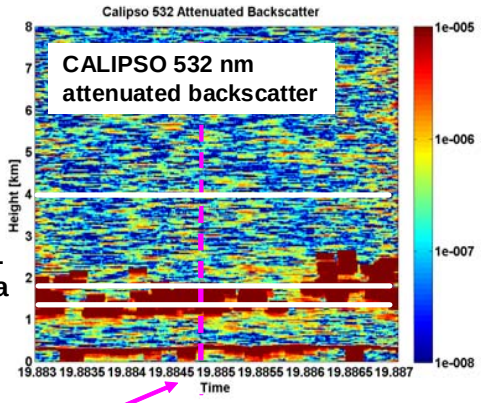
http://acrf-campaign.arm.gov/clasic/

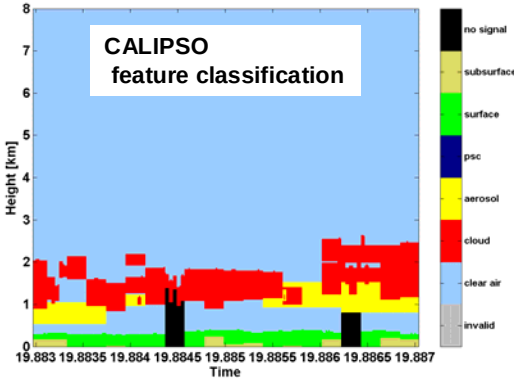
CALIPSO June 19th

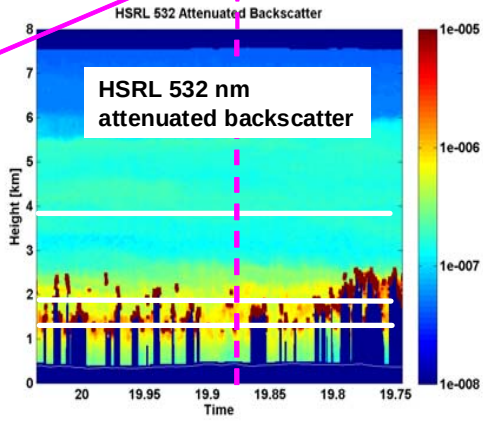
CIRPAS Twin Otter

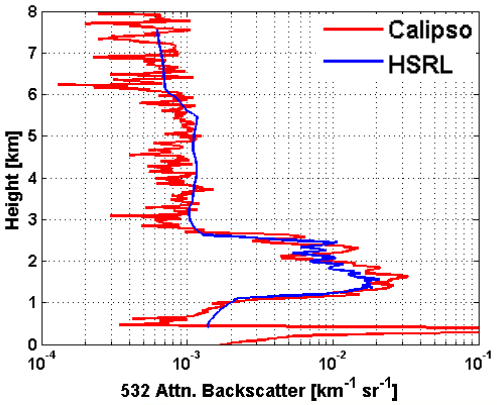
DOE G-1
IAP Cessna









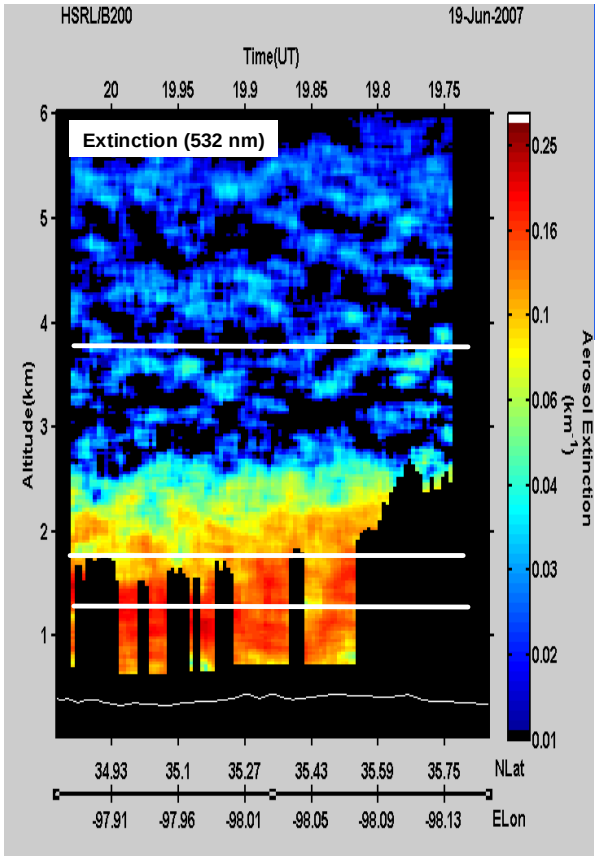


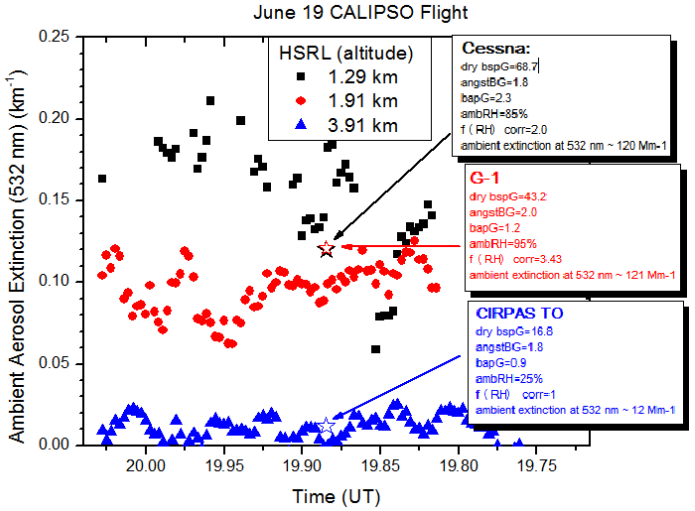
CALIPSO June 19th

CIRPAS Twin Otter

DOE G-1

DOE IAP Cessna





Overview

- What are the roles of cumulus convection and spatial variations in land cover in depleting low-level water vapor as it is advected into the SGP region?
- What are the relationships between cumulus clouds and the soil-plant-atmosphere exchange of heat, carbon, and water at the site?
- How do land cover changes, such as agricultural harvesting, impact surface heat, carbon, and water fluxes, and can those changes affect local and regional cumulus cloud formation at the ACRF SGP site?
- How do land surface processes at the SGP affect atmospheric aerosol loading and chemistry and what are the resulting effects on the microphysical and macrophysical properties of cumulus cloud fields?
- How well do the long-term (15+ years) surface flux measurements made at specific locations within the ACRF SGP represent the actual distribution of the fluxes across the domain?