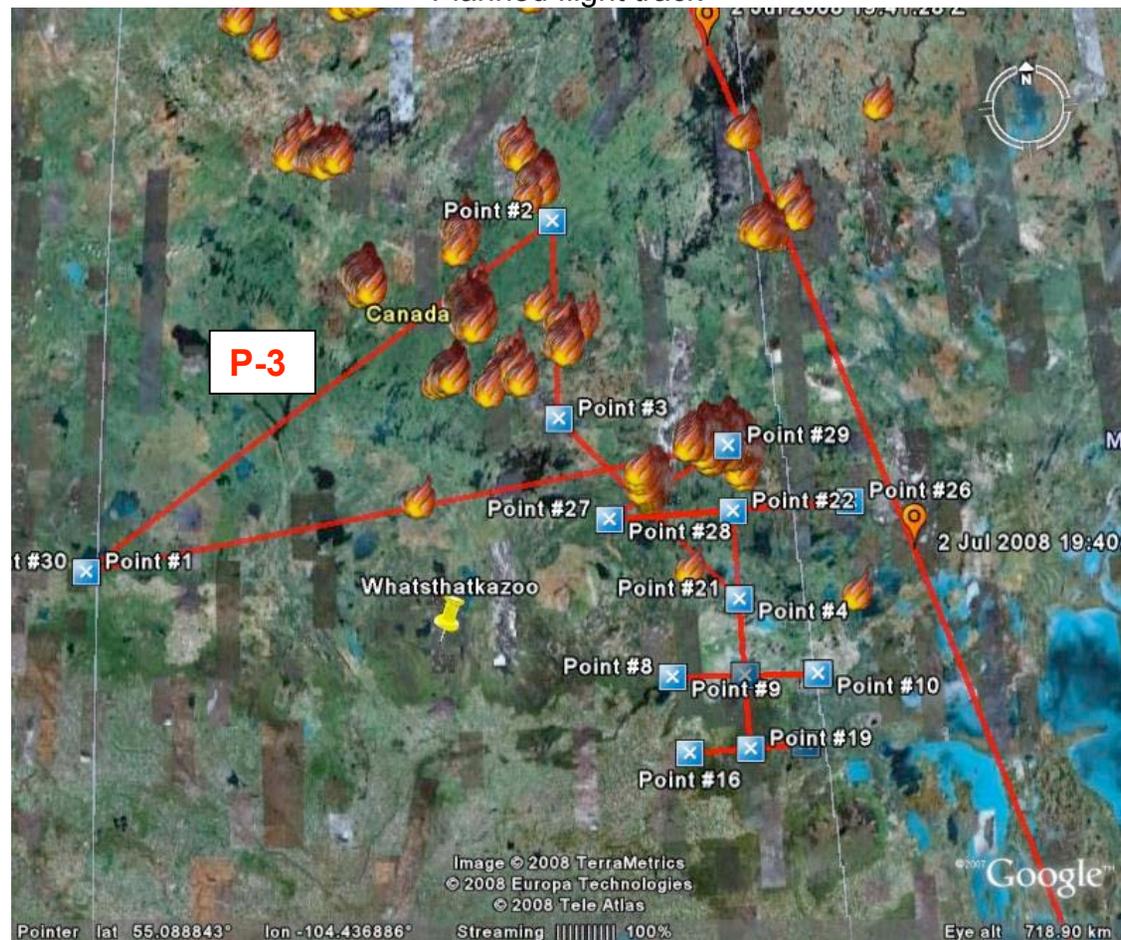


Flight Report
ARCTAS P-3B Data Flight 18, flown 2 July 2008 (Local Science)
Submitted by Jens Redemann

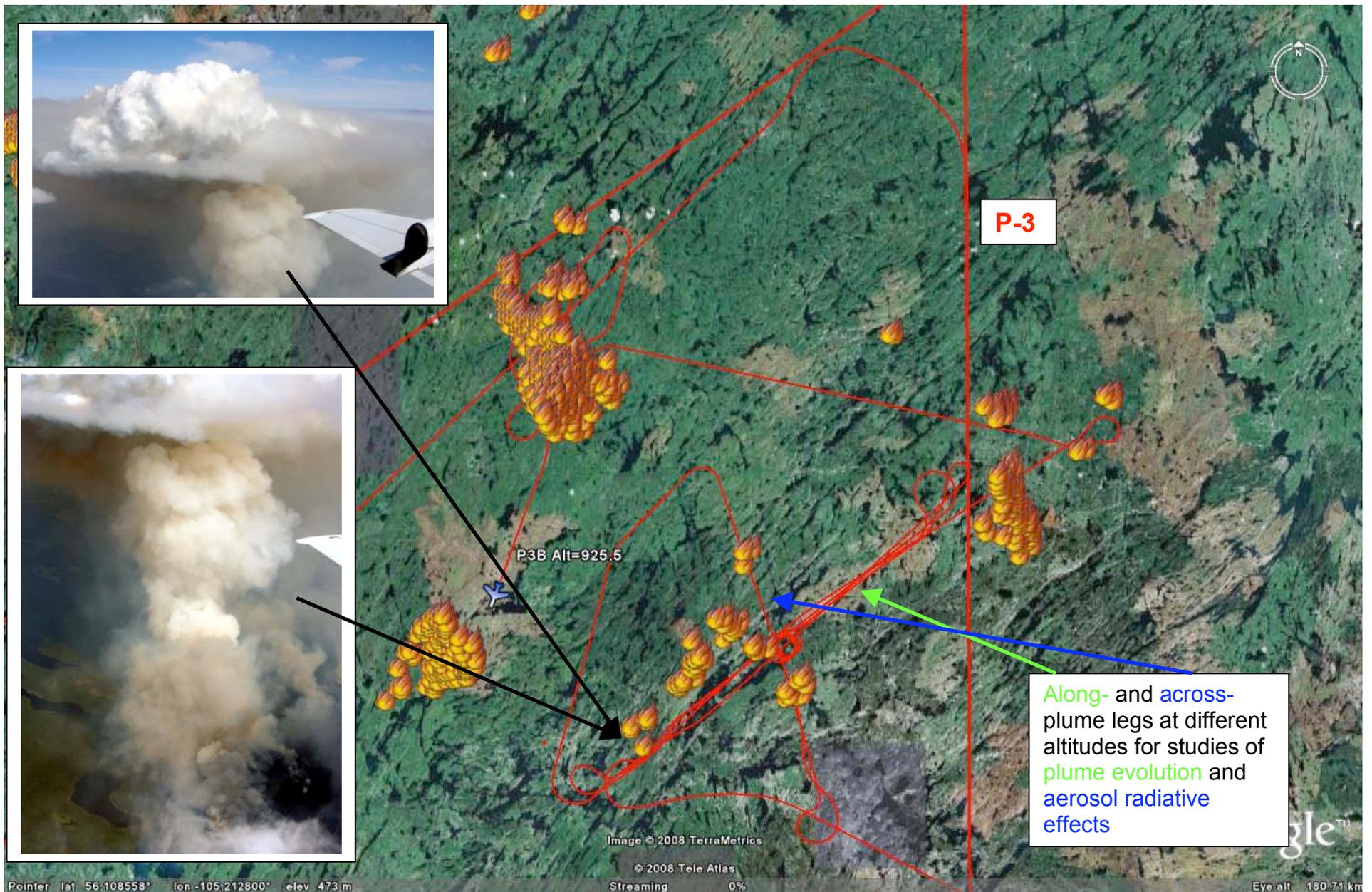
Objectives

- 1) a coordinated flight segment with the NASA B-200 (carrying an HSRL and the RSP instrument) under the Terra satellite,
- 2) several sets of stacked radiation legs,
- 3) in situ observations of flaming fires and plume evolution,
- 4) vertical profiles of plumes in homogeneous fire outflow regions.

Planned flight track



Actual P-3 flight track overlain onto MODIS-determined fire hot spots near WP#3 (see plan above), displayed onboard the P-3 in-flight; photos, courtesy of Cam McNaughton



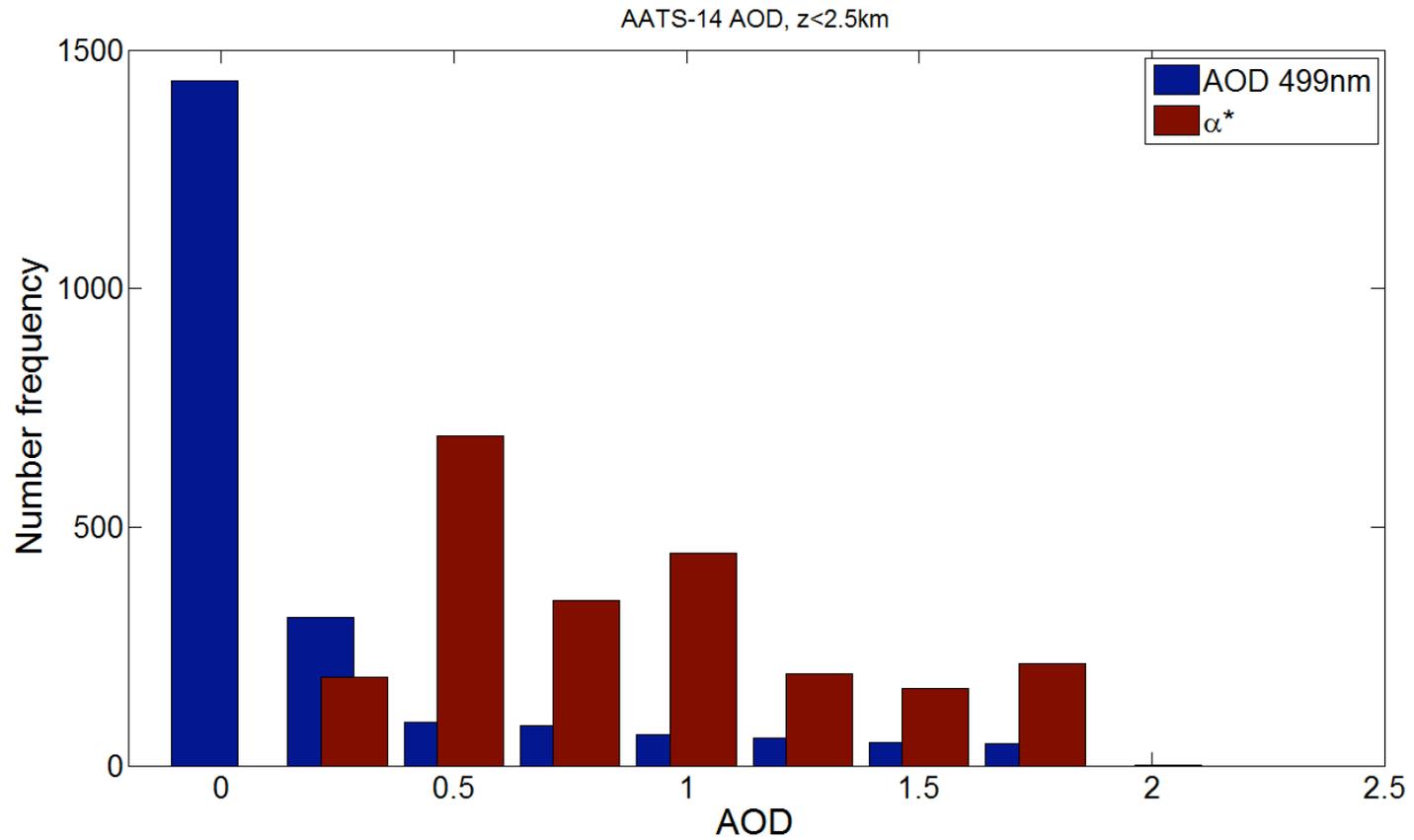


Figure. Frequency distributions of AATS-14 derived aerosol optical depth at 499nm and Angstrom exponent for all observations below an aircraft altitude of 2.5km asl. Note the considerable number of plume observations with AOD greater than 1. Data is preliminary.

Summary:

Another partially successful flight: Flight objectives included a coordinated flight segment with the NASA B-200 (carrying an HSRL and the RSP instrument) under the Terra satellite, several sets of stacked radiation legs, and in situ observations of flaming fires, plume evolution and vertical profiles of plumes in homogeneous fire outflow regions.

We rendezvoused with the B-200 at 16:25UT, and carried out the set of P-3 maneuvers for radiation objectives as planned, with the B-200 exactly collocated with the P3 at 28kft for about 50 minutes. The location of these maneuvers had to be adjusted in response to plume location and cloud conditions found during flight. The objective to do these measurements within the MISR field of view was abandoned due to lack of fires within the MISR swath. Guided by scientists on the ground, we broke off from the original flight plan to observe fires that were more active and under less cloudy conditions than the previously targeted fire hot spots. We were affected by thin Ci and broken Cu at the more active fires as well. We penetrated the most active fire plume near Reindeer Lake (55.8N/105.2W) at three different altitudes and performed along-plume axis legs for about 50 miles at the same altitudes to study the evolution of aerosol microphysics during down-wind transport. In addition we carried out a vertical profile in the most homogeneous part of the plume and an across-plume low-level leg for radiations purposes (low-level mid-visible AOD of up to 2). We proceeded to multiple fires that were selected using the RTMM (Real Time Mission Manager) displayed MODIS fire hot spots. On one occasion, we sampled outflow from a pyro-Cumulus cloud and penetrated the cloud itself for microphysical observations. Radiation objectives after the intensive in situ observations were aborted because of the presence of thin Cirrus and broken Cumulus cloud fields. Communication with ground-based scientists, and on the aircraft between Flight Scientist and Flight Deck was excellent.

Timeline:

15:30UT: Take-off

15:31UT: En route to rendez-vous with B-200 near Reindeer Lake

16:25UT: Rendez-vous with B-200 near Reindeer Lake

17:15UT: Radiation legs under B-200, some Cirrus present, scatter Cu as well

18:05UT: Breaking off from B-200, vectoring to fires and locations with less clouds as advised by scientists on ground

18:49UT: Maneuvering for along-plume runs near Reindeer Lake, multiple runs at different altitudes

19:32UT: Vertical descent in area of homogeneous plume

20:02UT: Maneuvering for across-plume radiation runs

20:30UT: In situ sampling of multiple fire plumes of varying size and age en route home

21:50UT: Touch-Down

Instrument Reports 2 July 2008

AATS-14	Excellent -No problems	Set for 03 Jul 08
Status during flight (up/down)		
Accomplishments		
Issues encountered		
Status for next flight		
Postflight requirements		
Comments		

Aero 3X	Everything worked fine	Set for 03 Jul 08
Status during flight (up/down)	Main AERO 3X Instrument absent	With same set up
Accomplishments	Good Data for Relative Humidity System	
Issues encountered	Main AERO 3X Instrument due to return 5 July	
Status for next flight		
Postflight requirements		
Comments		

BBR	Worked Well – No Problems	Set for 03 Jul 08
Status during flight (up/down)		
Accomplishments		
Issues encountered		
Status for next flight		
Postflight requirements		
Comments		

CAR & CANS	Very Good Data	Set for 03 Jul 08
Status during flight (up/down)		
Accomplishments		
Issues encountered		
Status for next flight		
Postflight requirements		
Comments		

CCN	Worked Well	Set for 03 Jul 08
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Status during flight (up/down)	
Accomplishments	
Issues encountered	
Status for next flight	
Postflight requirements	
Comments	

COBALT	COBALT Worked Well	Set for 03 Jul 08
Status during flight (up/down)	Inlet Problem solved	
Accomplishments		
Issues encountered		
Status for next flight		
Postflight requirements		
Comments		

HIGEAR	Excellent Flight	Set for 03 Jul 08
Status during flight (up/down)		
Accomplishments		
Issues encountered		
Status for next flight		
Postflight requirements		
Comments		

AMS	Good Data	Set for 03 Jul 08
Status during flight (up/down)		
Accomplishments		
Issues encountered		
Status for next flight		
Postflight requirements		
Comments		

PDS	Fully Operational entire flight	Set for 03 Jul 08
Status during flight (up/down)		
Accomplishments		

Issues encountered	
Status for next flight	
Postflight requirements	
Comments	

REVEAL & RTMM	Very Good	Set for 03 Jul 08
Status during flight (up/down)		
Accomplishments		
Issues encountered		
Status for next flight		
Postflight requirements		
Comments		

SSFR	Very Good	Set for 03Jul 08
Status during flight (up/down)		
Accomplishments		
Issues encountered		
Status for next flight		
Postflight requirements		
Comments		

SUBMITTED BY: Colleen Kelly 2 July 2008