

NATIVE goes Foreign



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TC⁴ STM

26 April 2007

NATIVE



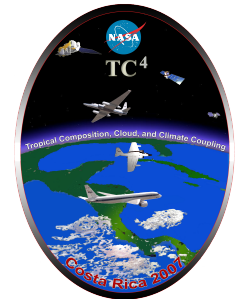
(www.meteo.psu.edu/~btaubman/Webpage/native.html)



Nittany Atmospheric Trailer and Integrated Validation Experiment

mobile research facility designed for:

- Satellite retrieval validation
- Ground-based complement to NASA field campaigns
- Mobile ozonesonde station
- Educational outreach
- Long term air quality monitoring
- Pollution transport and deposition





NATIVE Payload

In-situ instruments:

TeCo 49C O₃ Analyzer

TeCo 48C-TLE CO Analyzer

TeCo 43C-TLE SO₂ Analyzer

TeCo 42C NO, NO_y Analyzer

TSI SMPS

*En-Sci ECC Ozonesonde Ground Station

Meteorological Instruments (10 m tower):

T, RH, P, WS, and WD

Remote Sensing Instruments:

*MICROTOPS II O₃ Monitor – Sunphotometer

(305, 312, 320, 340, 380 nm)

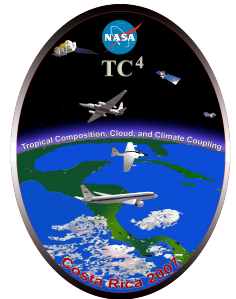
*Cimel Sunphotometer

(340, 380, 440, 500, 675, 870, 1020, 1640 nm)

YES UVMFR-7

(300, 305, 311, 317, 325, 332, 368 nm)

532 nm Aerosol Lidar





NATIVE Schedule

End of May, beginning of June?

- ship to Panama

End of June, beginning of July?

- meet NATIVE in Colón, transport to Las Tablas

July 7 - 12

- begin continuous measurements and sonde launches

July 12

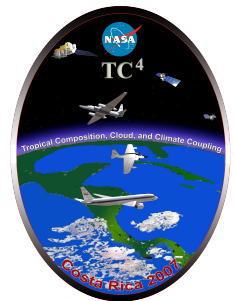
- official start date of research flights?

August 12

- last research flight?
- end continuous measurements and sonde launches

August 13

- ship back to PA





NATIVE Operations

Continuous Measurements

- Surface trace gases (TeCo)
- Surface aerosol size distribution (SMPS)
- Column ozone (UVMFR, Microtops)
- AOD (Cimel, UVMFR, MicroTops)
- Meteorology (R.M. Young)

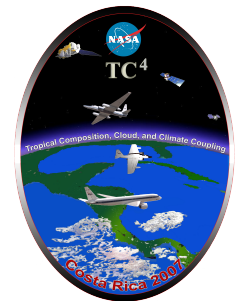
Semi-Continuous

- Aerosol lidar (PSU)

Daily – Multiple/Day

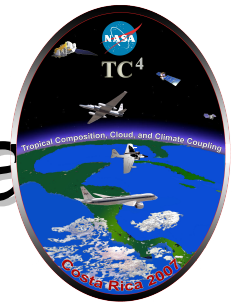
- ECC ozonesondes (En-Sci, Vaisala)

*Gary Morris and Valpo Crew

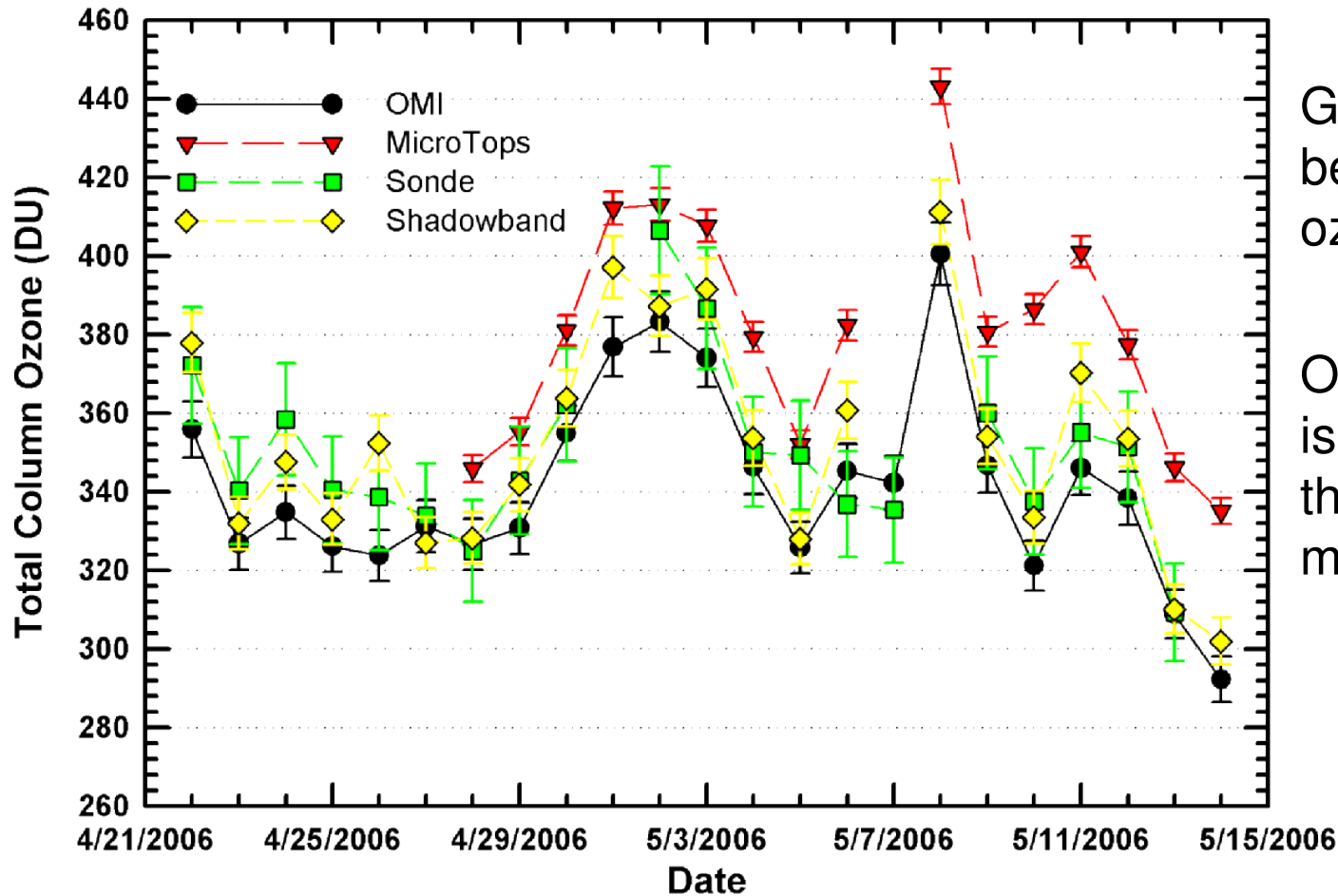




Invitation for NATIVE Participants



Total Column Ozone in Richland, WA measured by different instruments



Good correlation between column ozone values

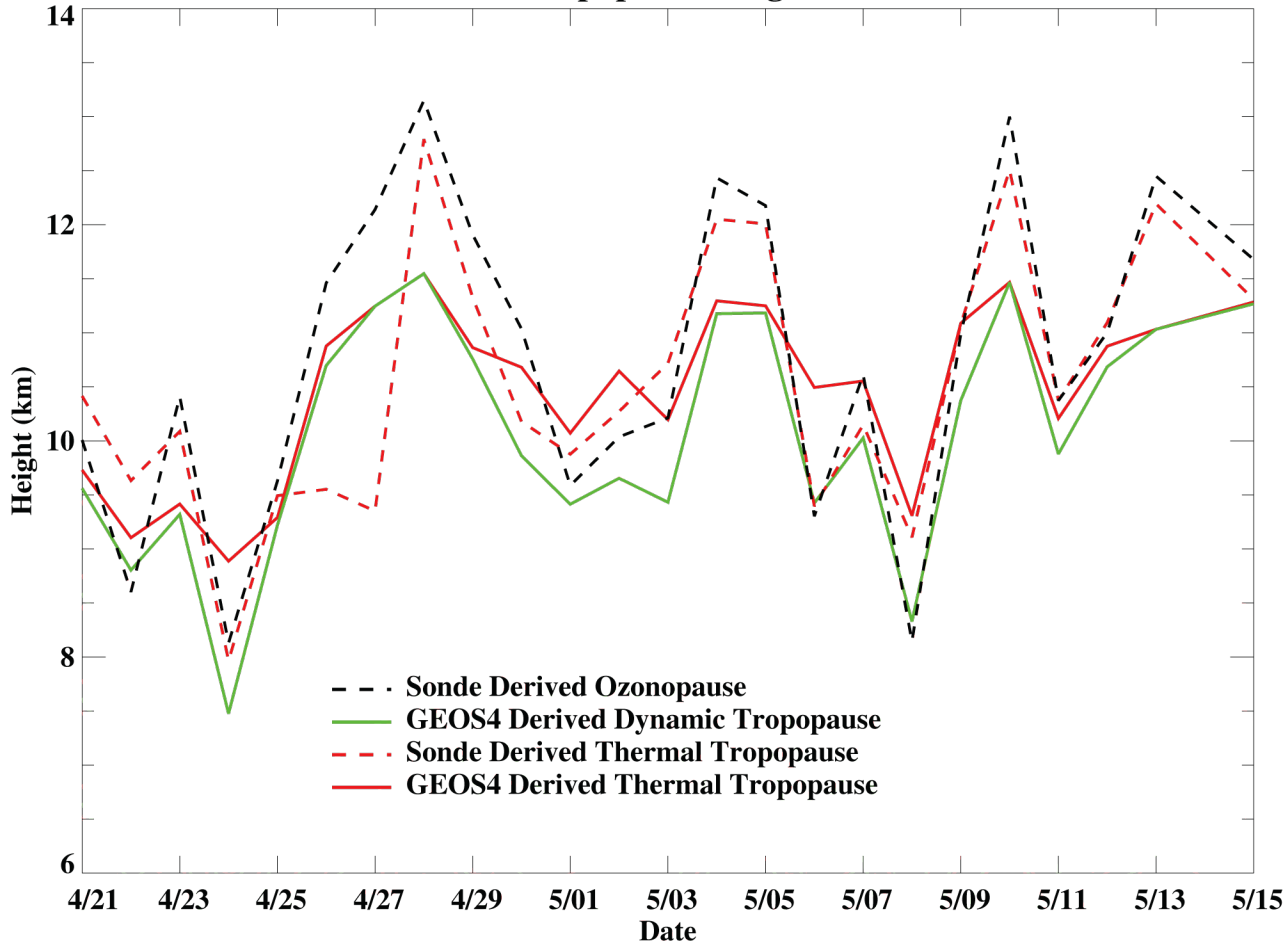
OMI-TOMS ozone is slightly lower than NATIVE measurements



Validation for NATIVE Participa

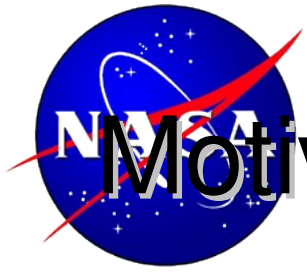


Tropopause Height



NATIVE sonde
trop height agrees
fairly well with
GEOS4 trop
heights

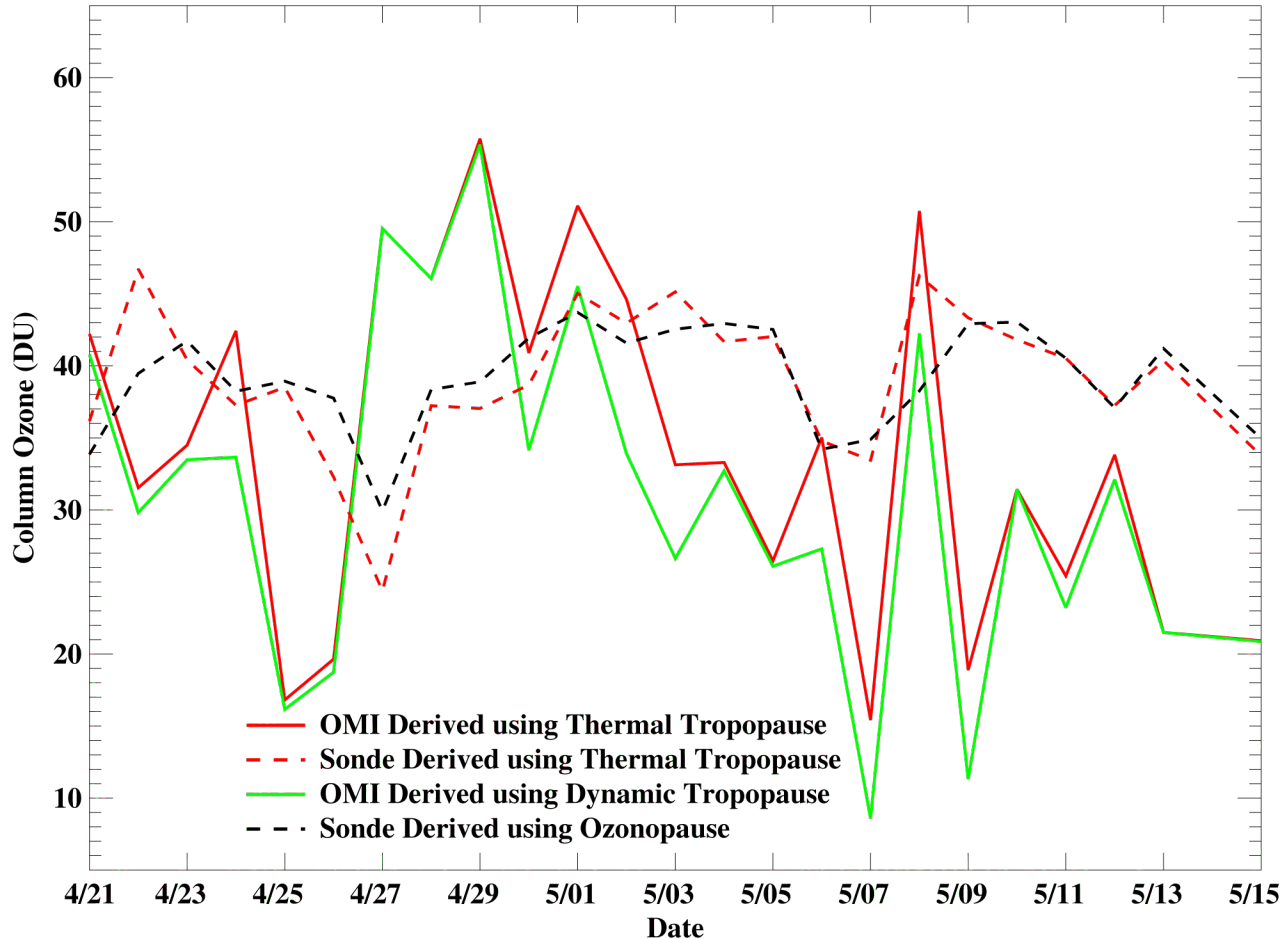
NATIVE heights
are generally
higher than
GEOS4 heights



Motivation for NATIVE Participation

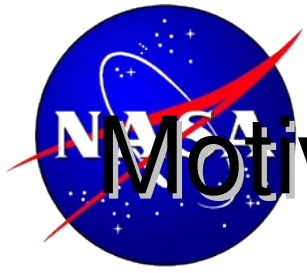


Total Tropospheric Ozone



Tropospheric O_3 using NATIVE sonde heights is less variable than OMITOC – MLSSOC TOR values

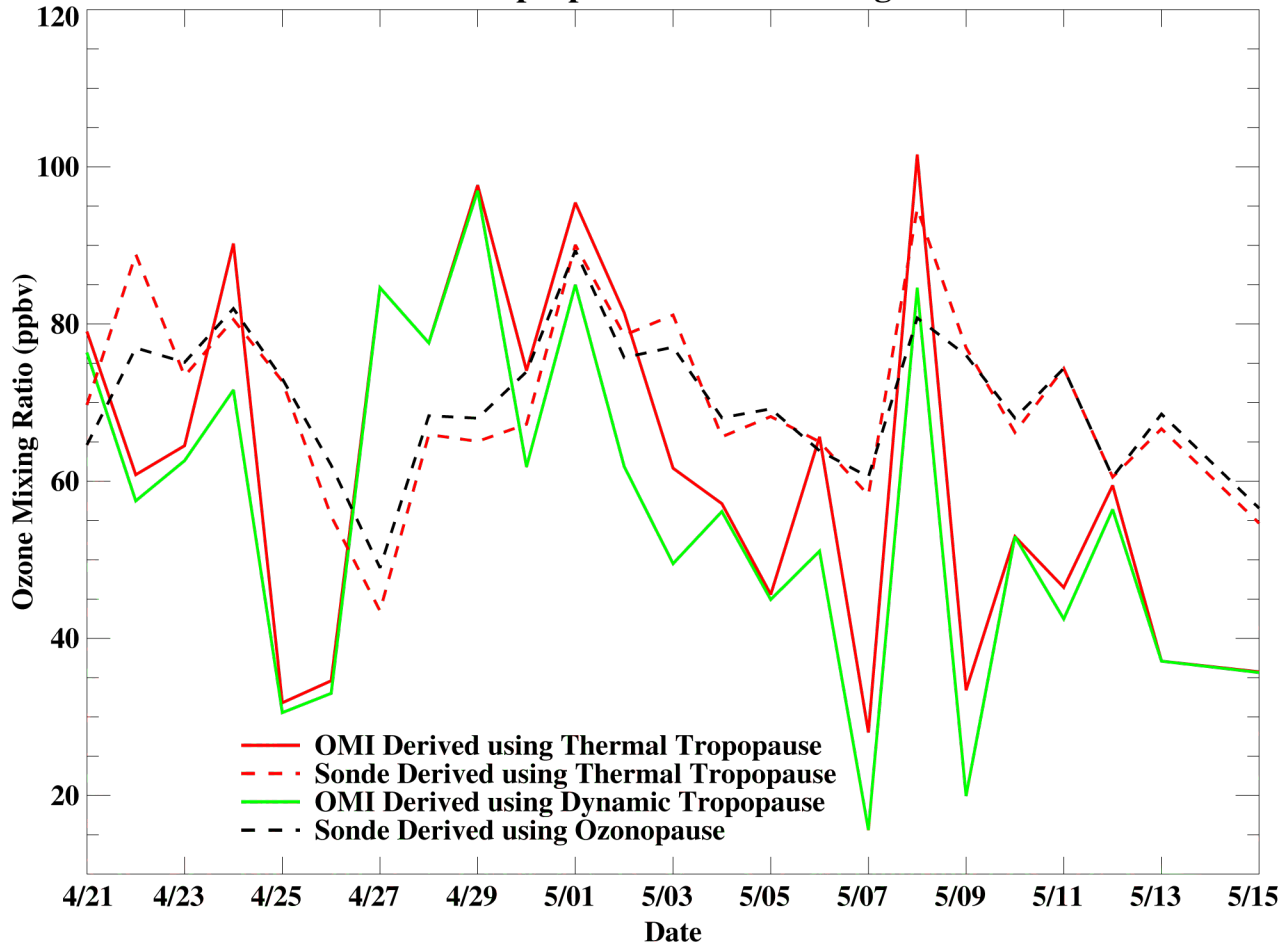
NATIVE Tropospheric O_3 is generally greater than OMI – MLS derived TOR



Motivation for NATIVE Participation

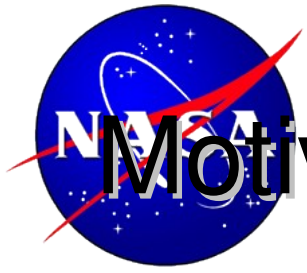


Mean Tropospheric Ozone Mixing Ratio



TOMR results are very similar to TOC results

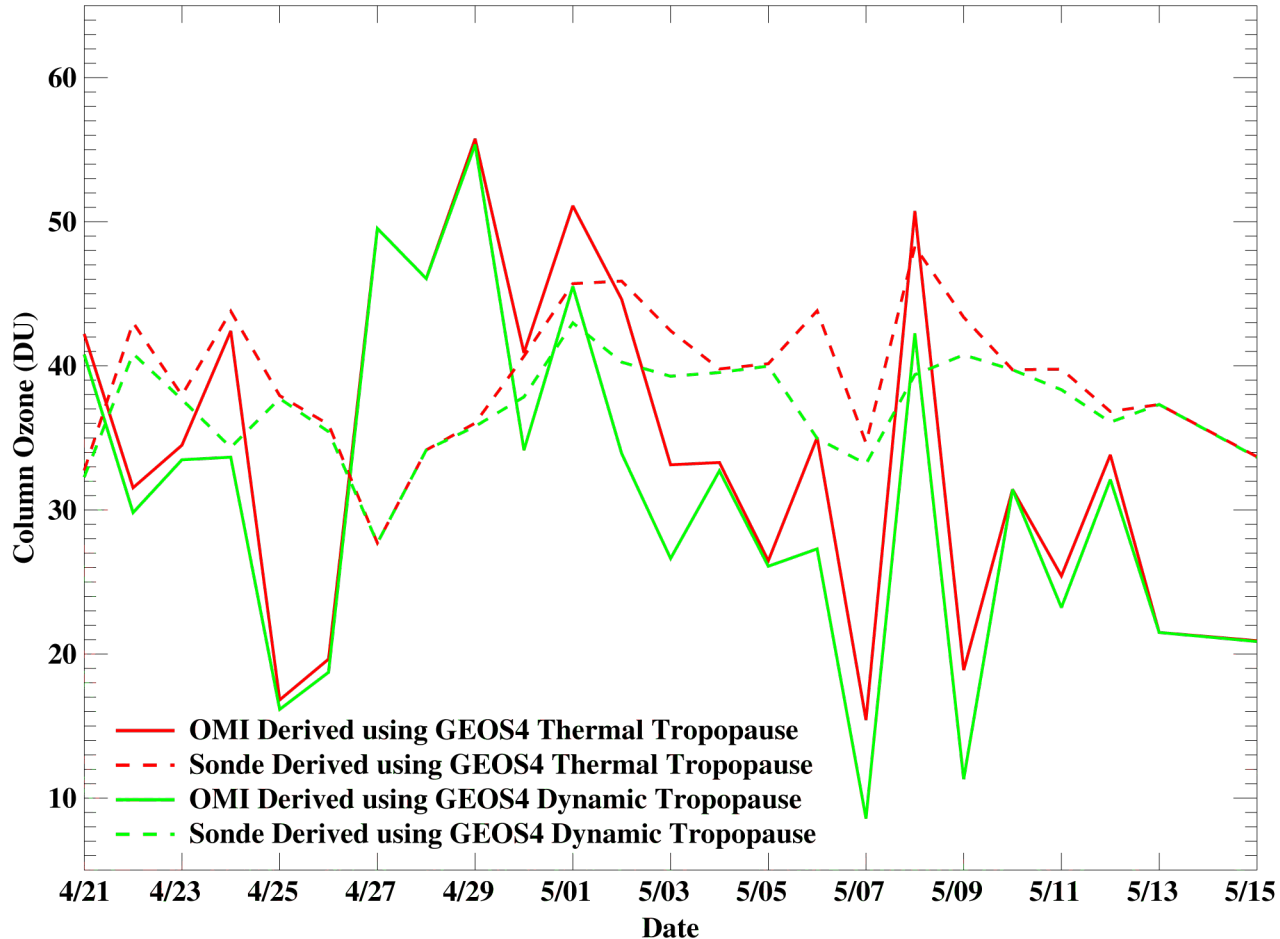
Less variability seen in NATIVE sonde data than OMI – MLS derived product



Motivation for NATIVE Participation



Total Tropospheric Ozone



Used the GEOS4 trop heights to calculate NATIVE sonde Tropospheric O₃ (apples to apples comp.)

Results look similar to when using sonde trop heights

Results indicate uncertainty lies in MLS SOC retrieval

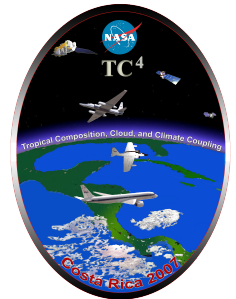
NATIVE site preference

Cerro Cerrezuela

Location: 7.790648°N, 80.276602°W
North of Las Tablas
located on the hill behind
the regional university

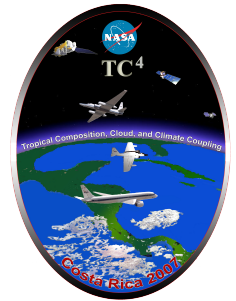
Advantages: owned by university, access to U.
outside of city (local pollution source)
*covered gazebo for balloons
closer to preferred hotel
logistically easier than other sites
(for us)

Disadvantages: won't work for NASA radar



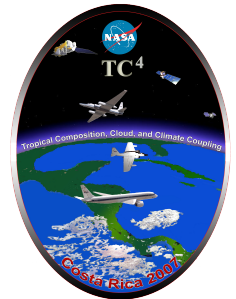
NATIVE site preference Cerro Cerrezuela

PENNSTATE



NATIVE site preference Cerro Cerrezuela

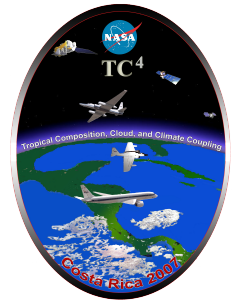
PENNSTATE



NATIVE site preference

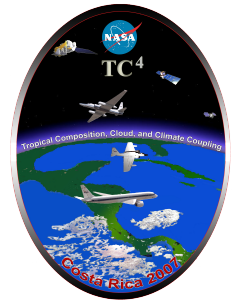
Cerro Cerrezuela

PENNSTATE



NATIVE site preference Cerro Cerrezuela

PENNSTATE





Acknowledgements

*NASA EOS Aura Validation and TCP (INTEX-B and TC⁴)

*Everyone in Panama who is making this possible

*Bojan Bojkov, Jacquie Hui, Nick Krotkov, Gordon Labow, Jim Mather, Dave Miller, Sonya Miller, Paul Newman, John Yorks, and everybody else I'm forgetting

Visit us at:

<http://www.meteo.psu.edu/~btaubman/Webpage/native.html>

