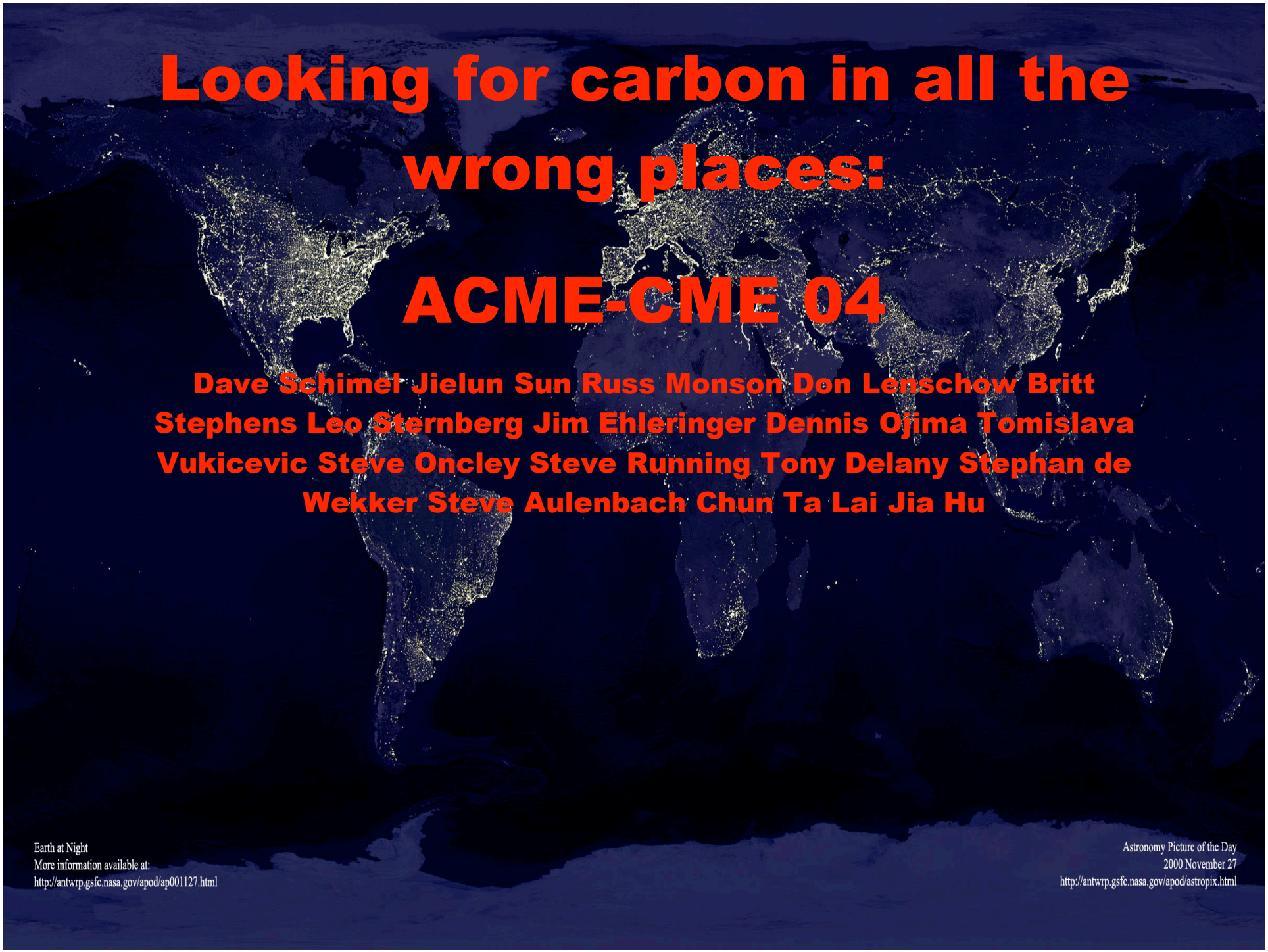
Looking for carbon in all the wrong places:

ACME-CME 04

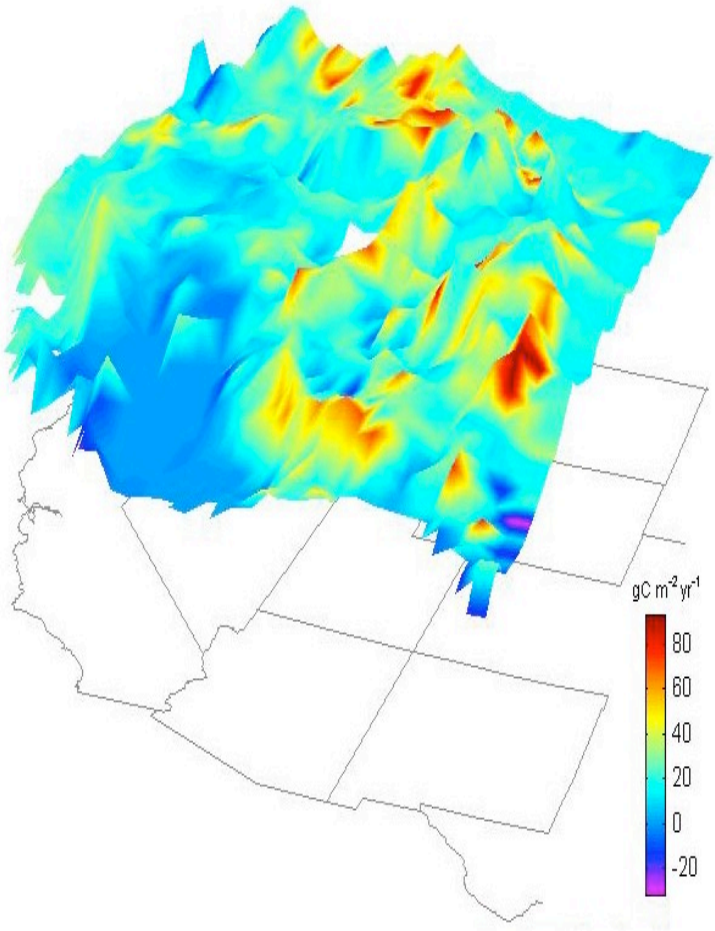
Dave Schimel Jielun Sun Russ Monson Don Lenschow Britt Stephens Leo Sternberg Jim Ehleringer Dennis Ojima Tomislava Vukicevic Steve Oncley Steve Running Tony Delany Stephan de Wekker Steve Aulenbach Chun Ta Lai Jia Hu

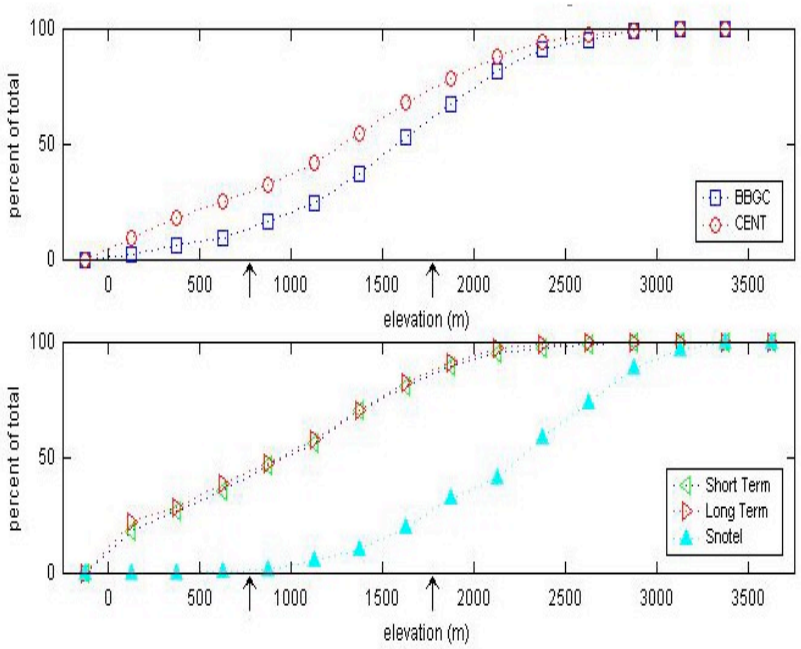


Earth at Night
More information available at:
http://antwrp.gsfc.nasa.gov/apod/ap001127.html

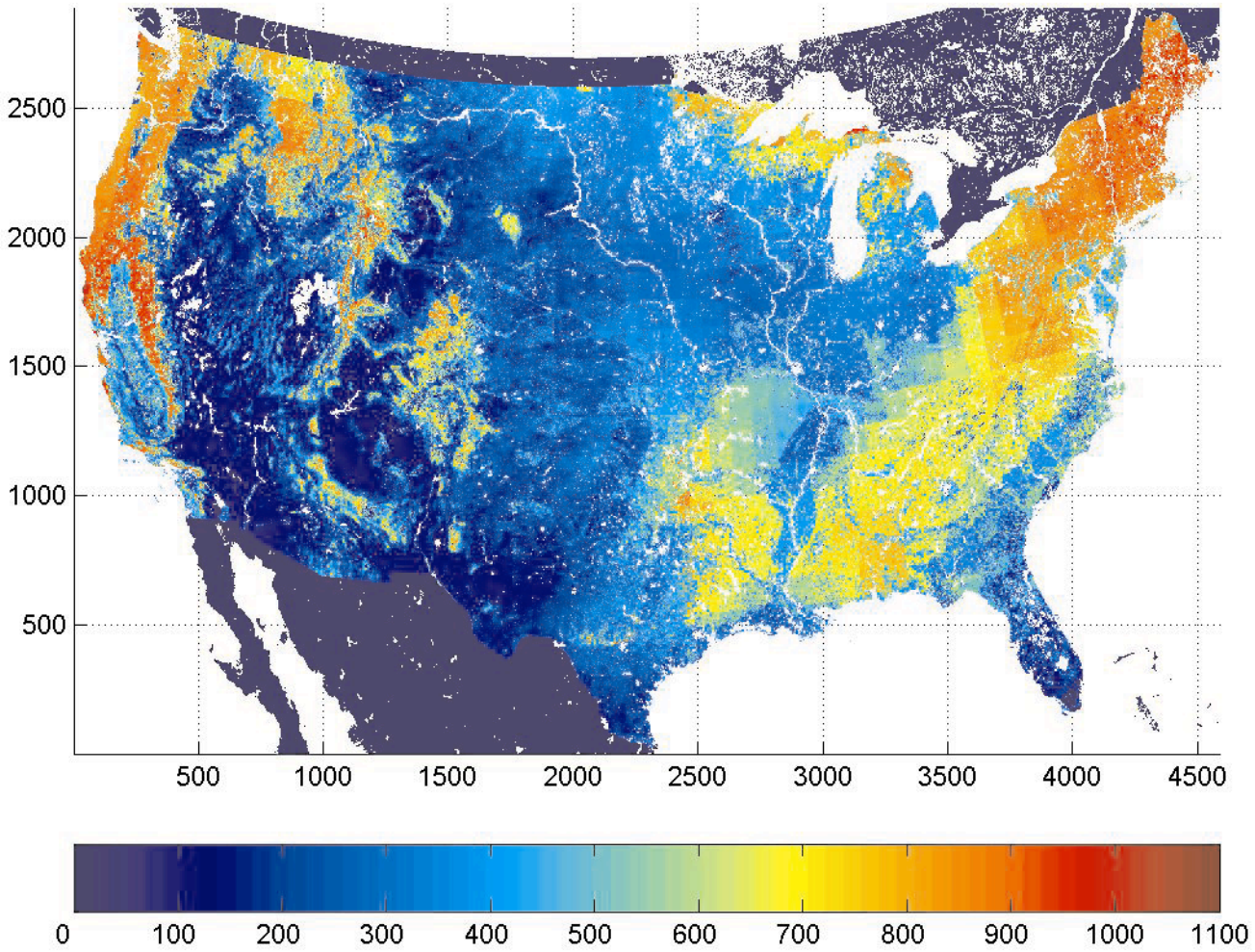
Astronomy Picture of the Day
2000 November 27
http://antwrp.gsfc.nasa.gov/apod/astropix.html

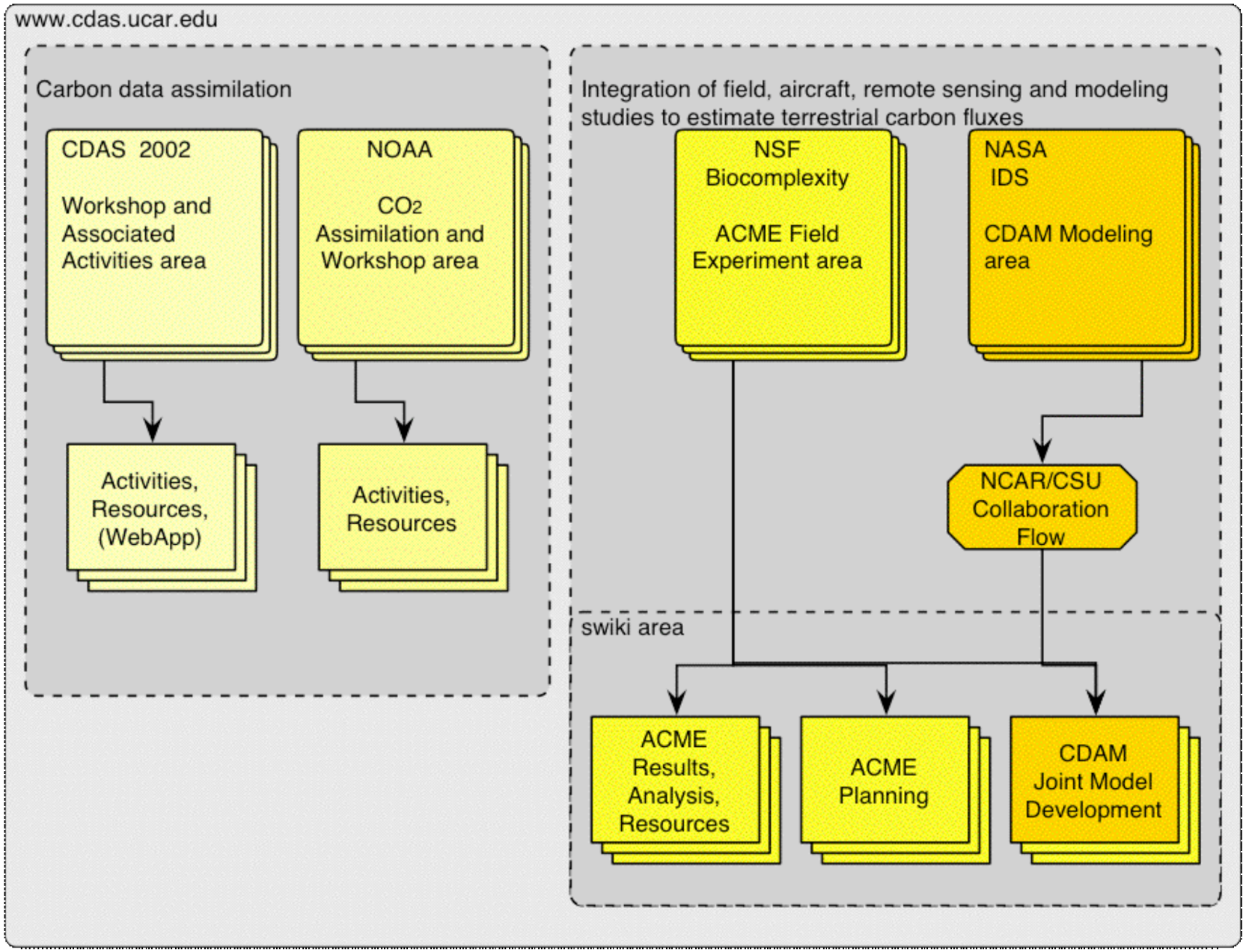
Modeling carbon exchange

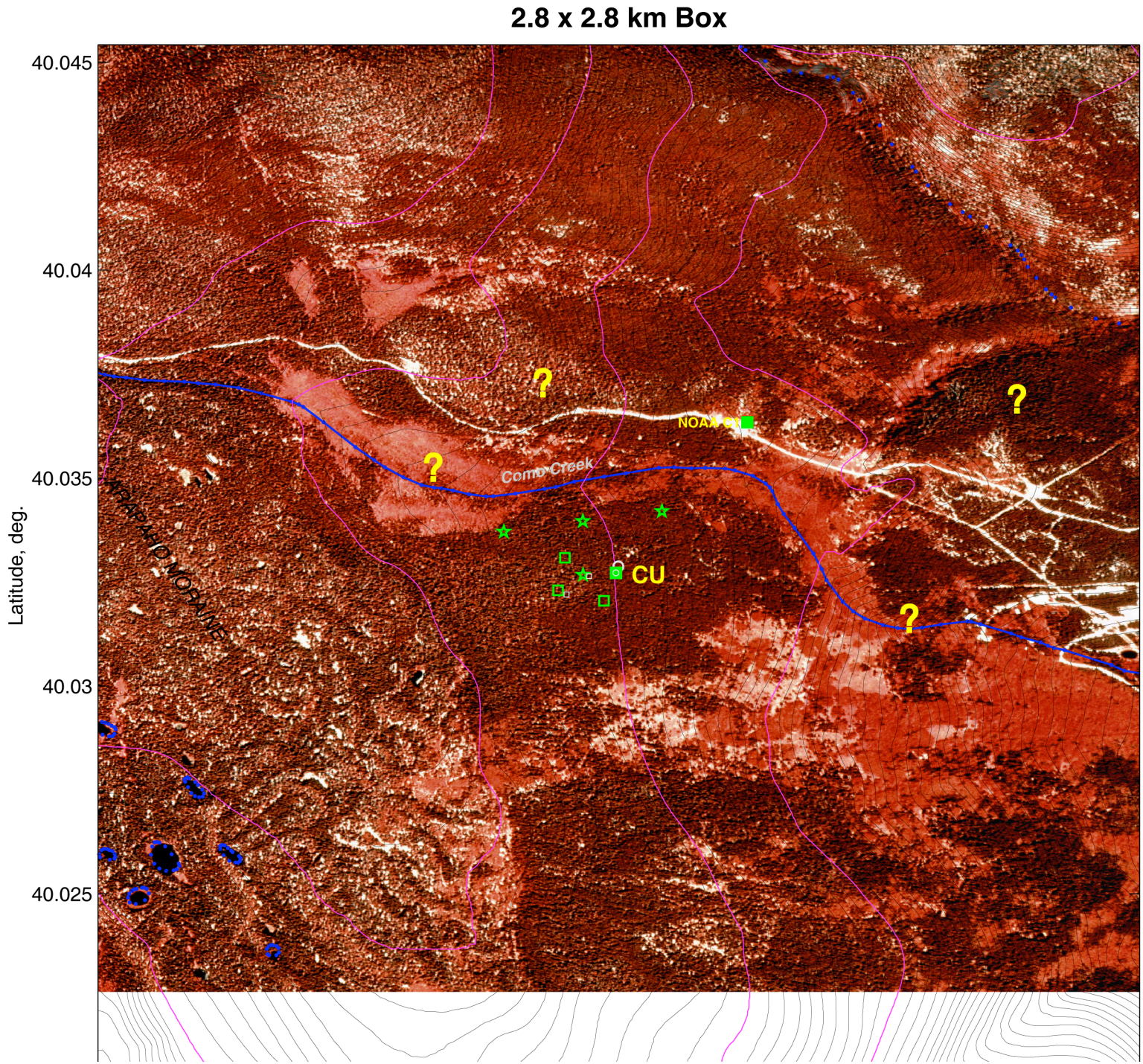




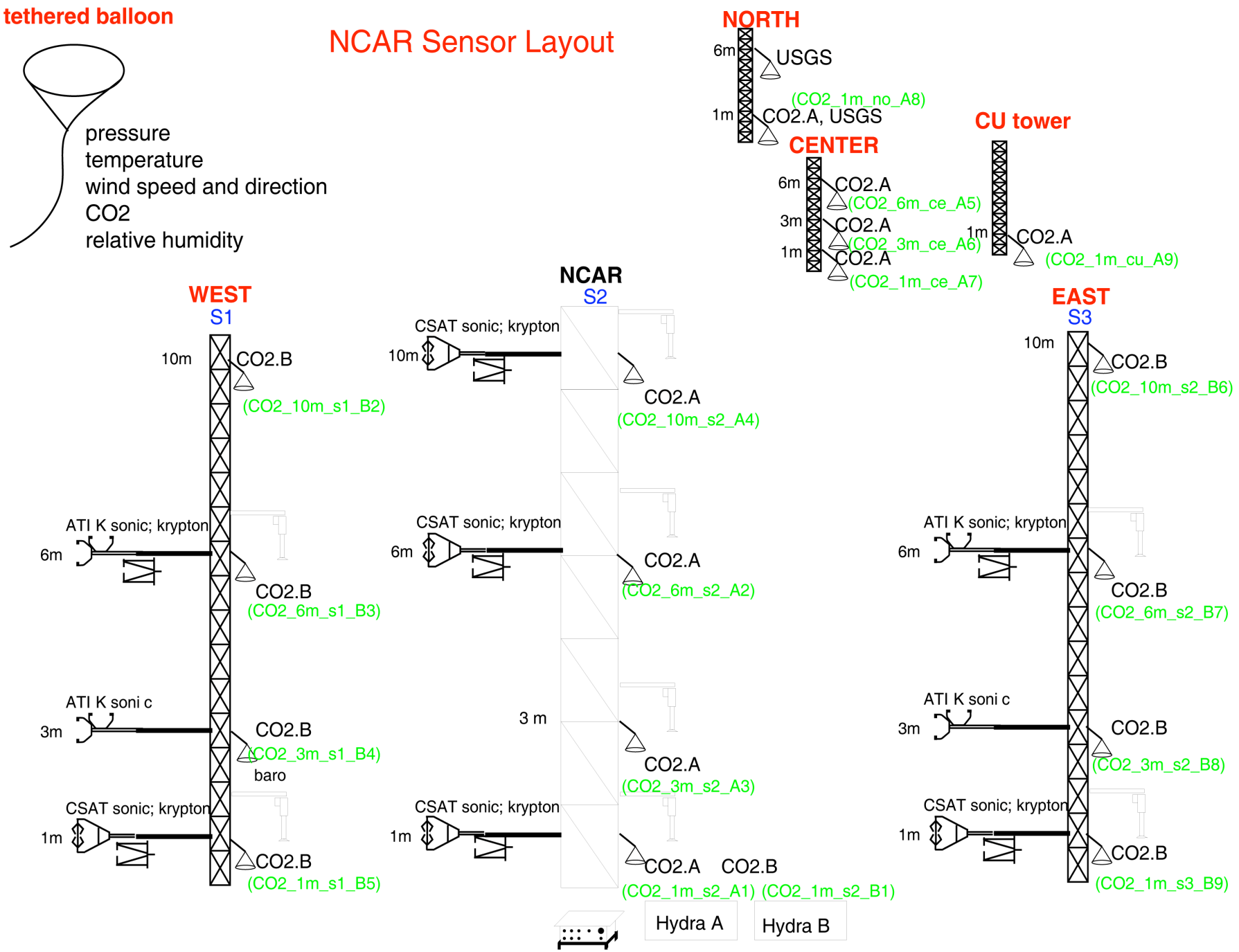
Half or more of US GPP is in mountainous regions



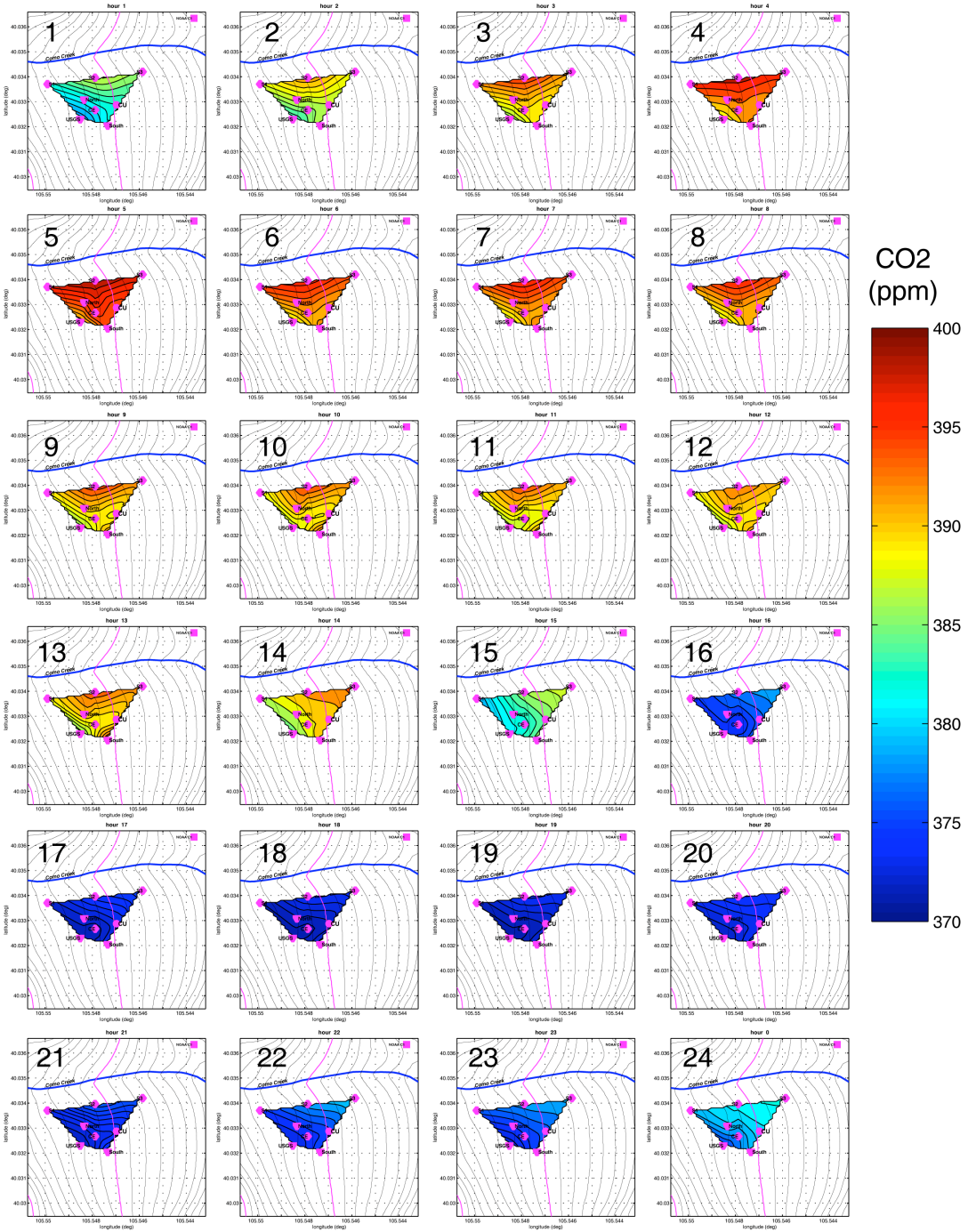

www.cdas.ucar.edu
Carbon data assimilation
CDAS 2002
Workshop and Associated Activities area
NOAA
CO2 Assimilation and Workshop area
Activities, Resources, (WebApp)
Activities, Resources
Integration of field, aircraft, remote sensing and modeling studies to estimate terrestrial carbon fluxes
NSF Biocomplexity
ACME Field Experiment area
NASA IDS
CDAM Modeling area
NCAR/CSU Collaboration Flow
swiki area
ACME Results, Analysis, Resources
ACME Planning
CDAM Joint Model Development


2.8 x 2.8 km Box
40.045
40.04
40.035
40.03
40.025
Latitude, deg.
?
?
?
?
NOAA CT
Como Creek
CU
MORAINE

NCAR Sensor Layout

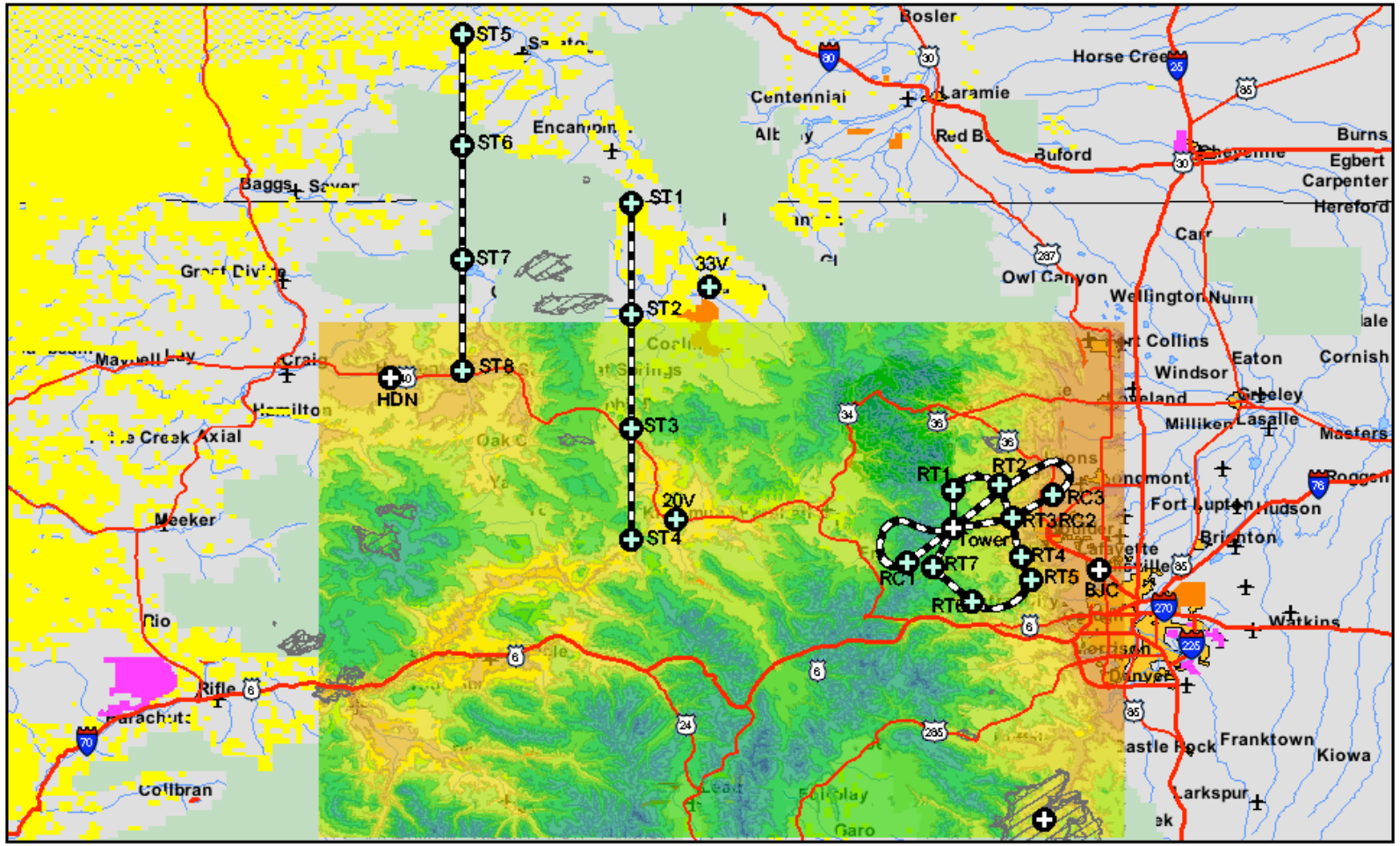


Diurnal variations of spatial variations of CO2 (UTC)

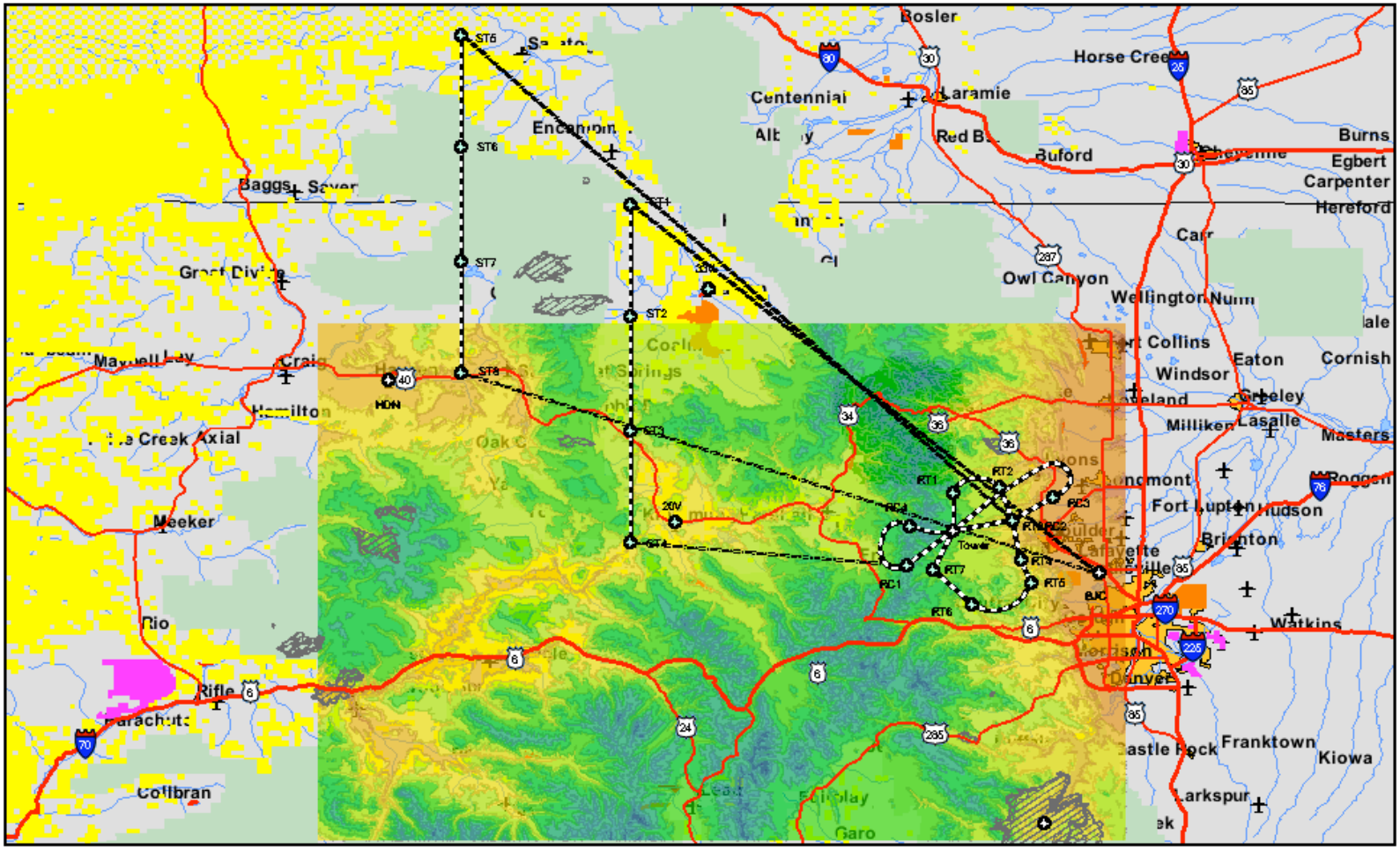


Airborne Carbon in the Mountains Experiment

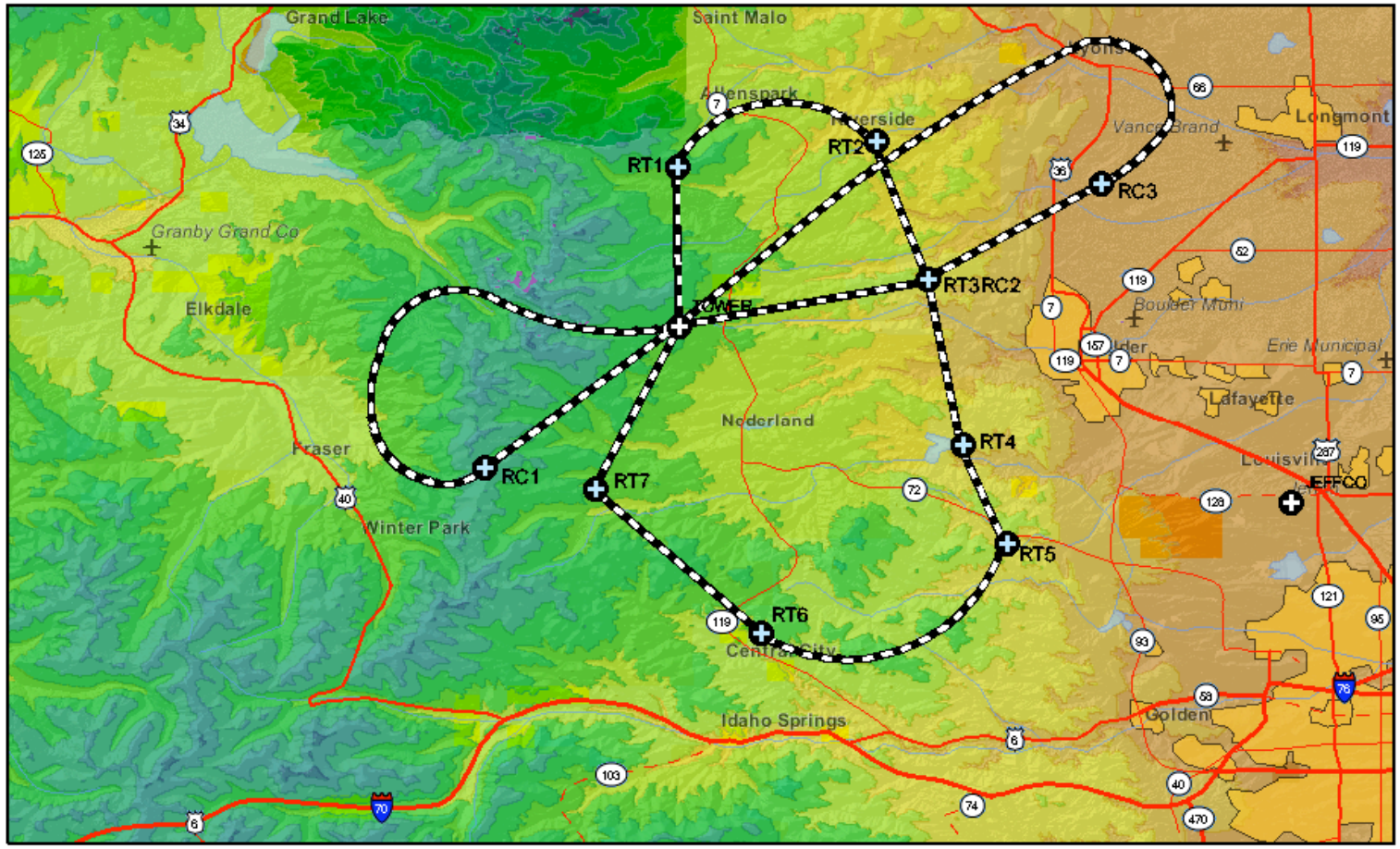
DRAFT: ACME Morning Flight



DRAFT: ACME Morning Flight



DRAFT: ACME Racetrack and Rollercoaster Flight Tracks

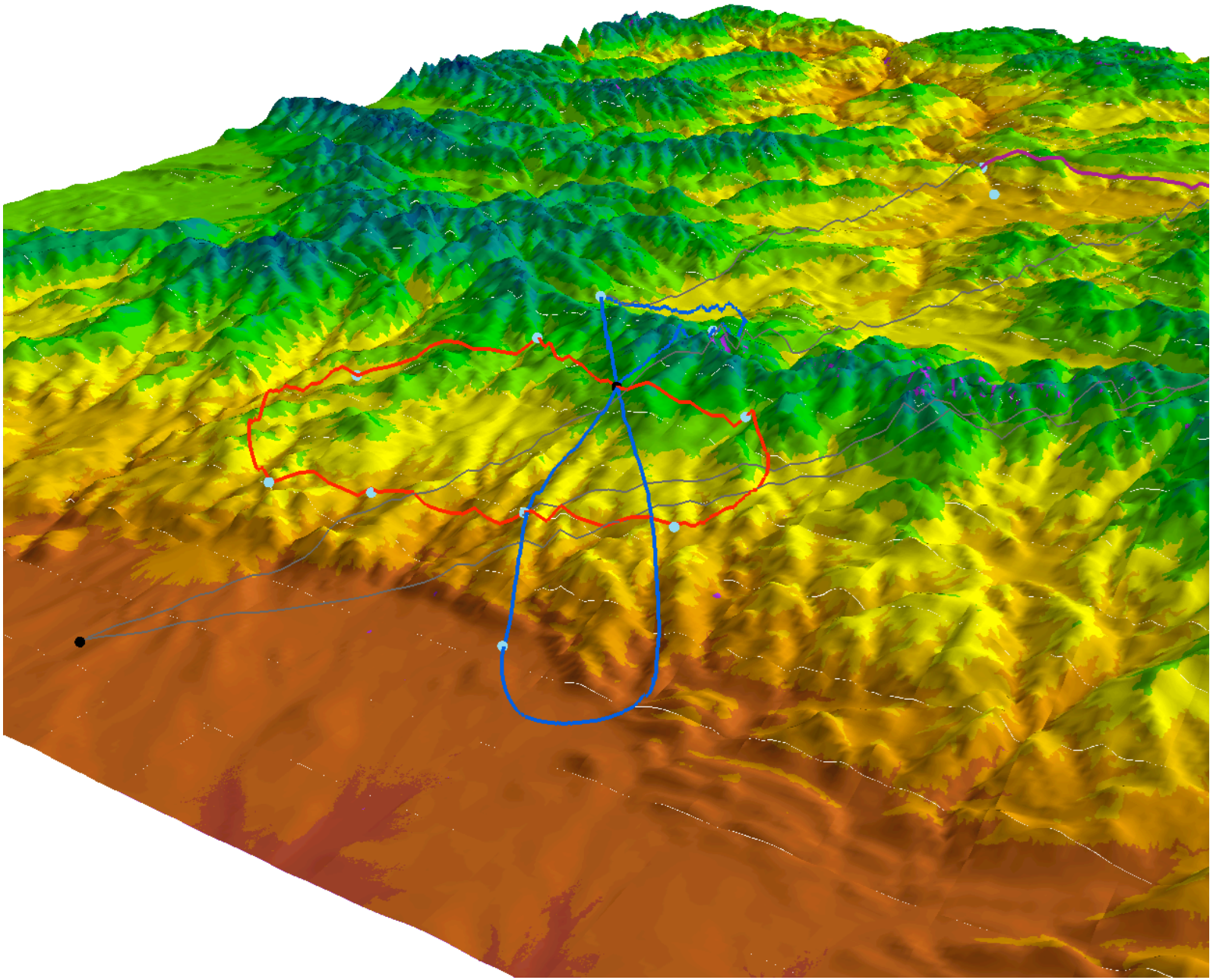


Legend

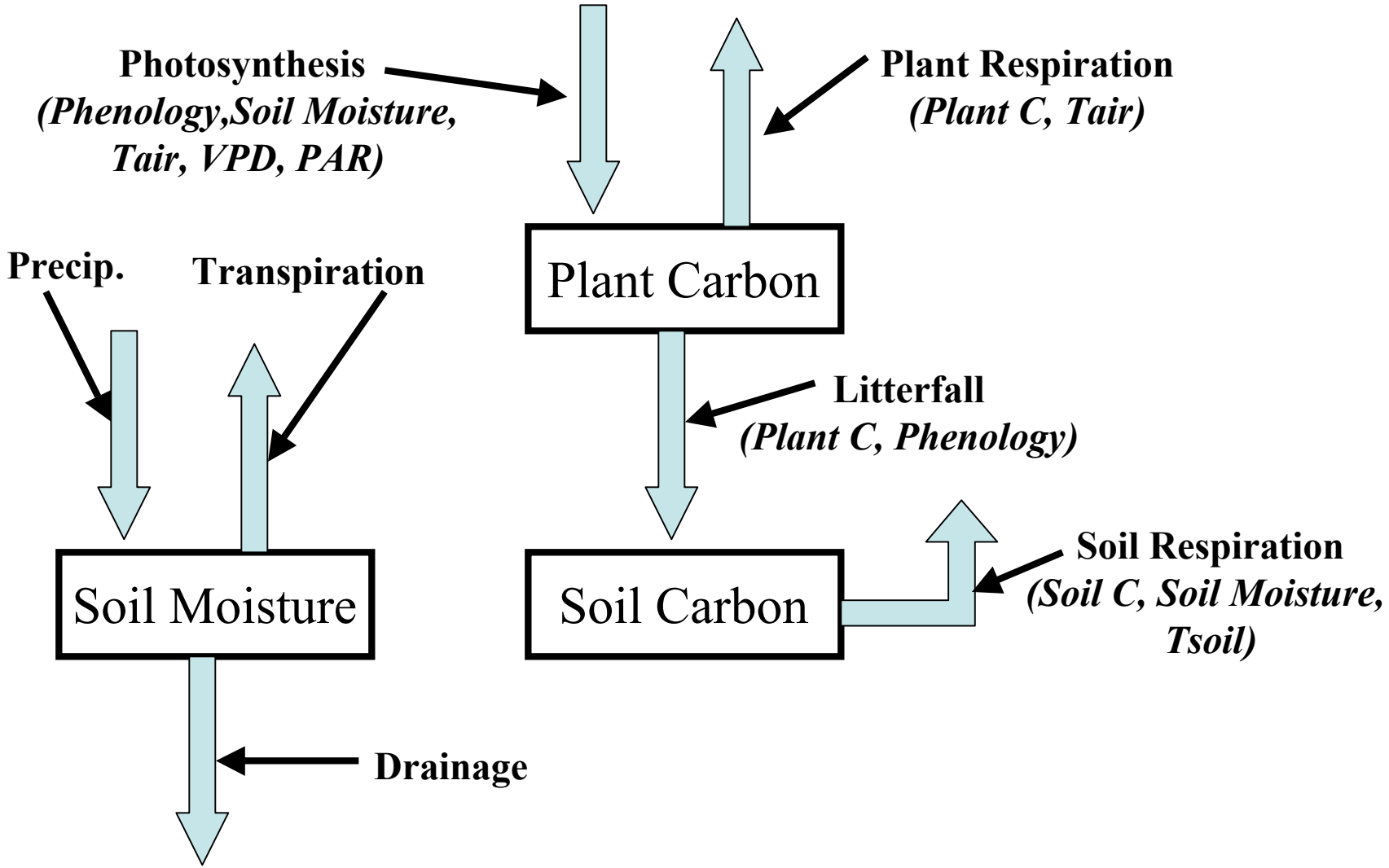
Elevation (ft)

N

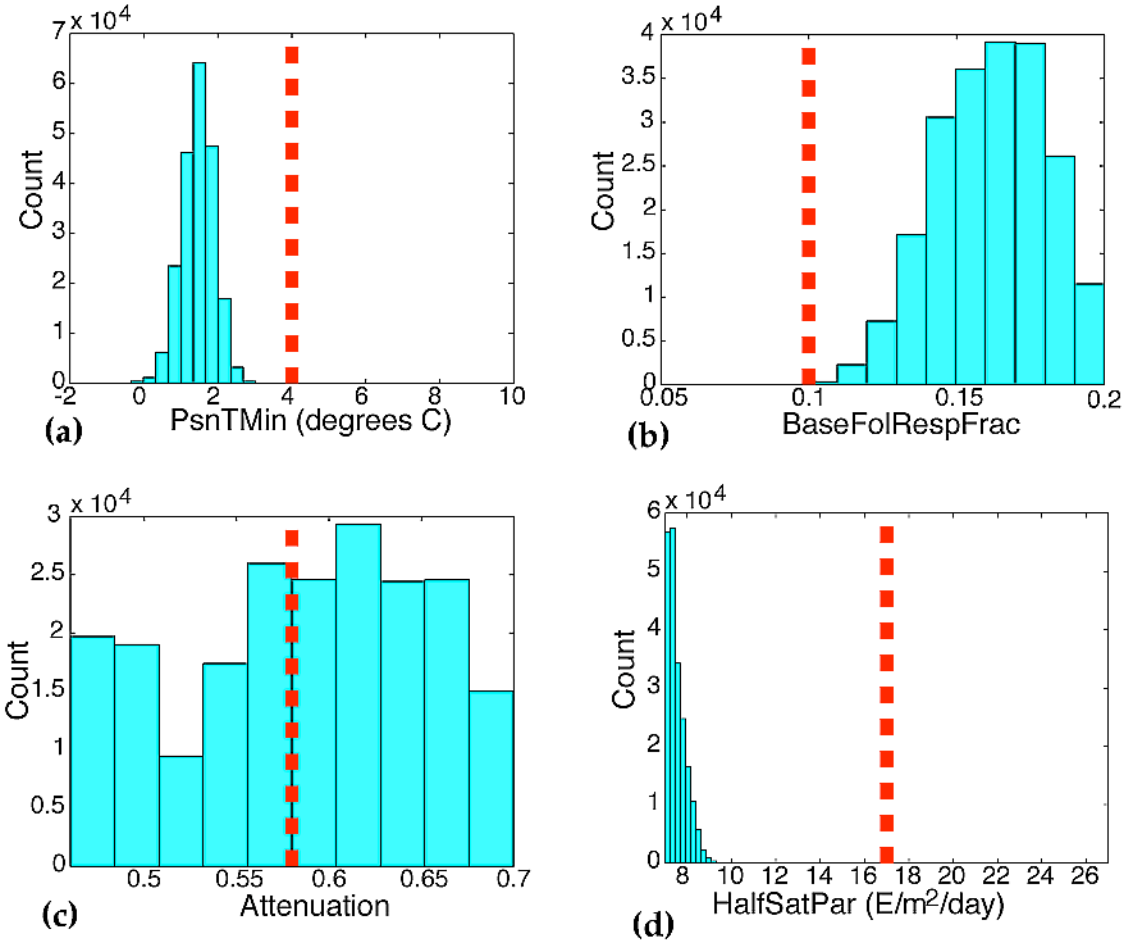
0 2.5 5 10 15 20 Nautical Miles

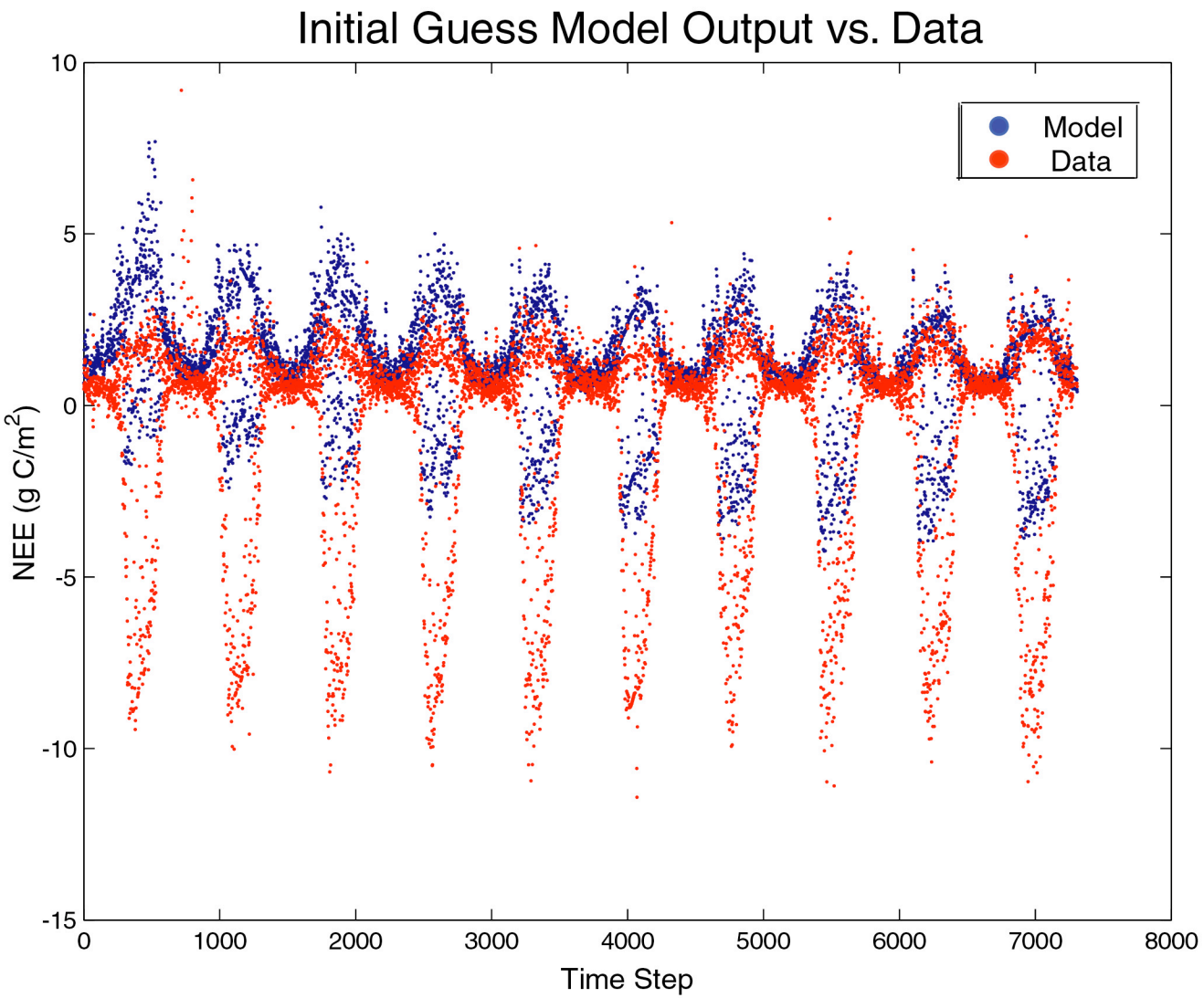


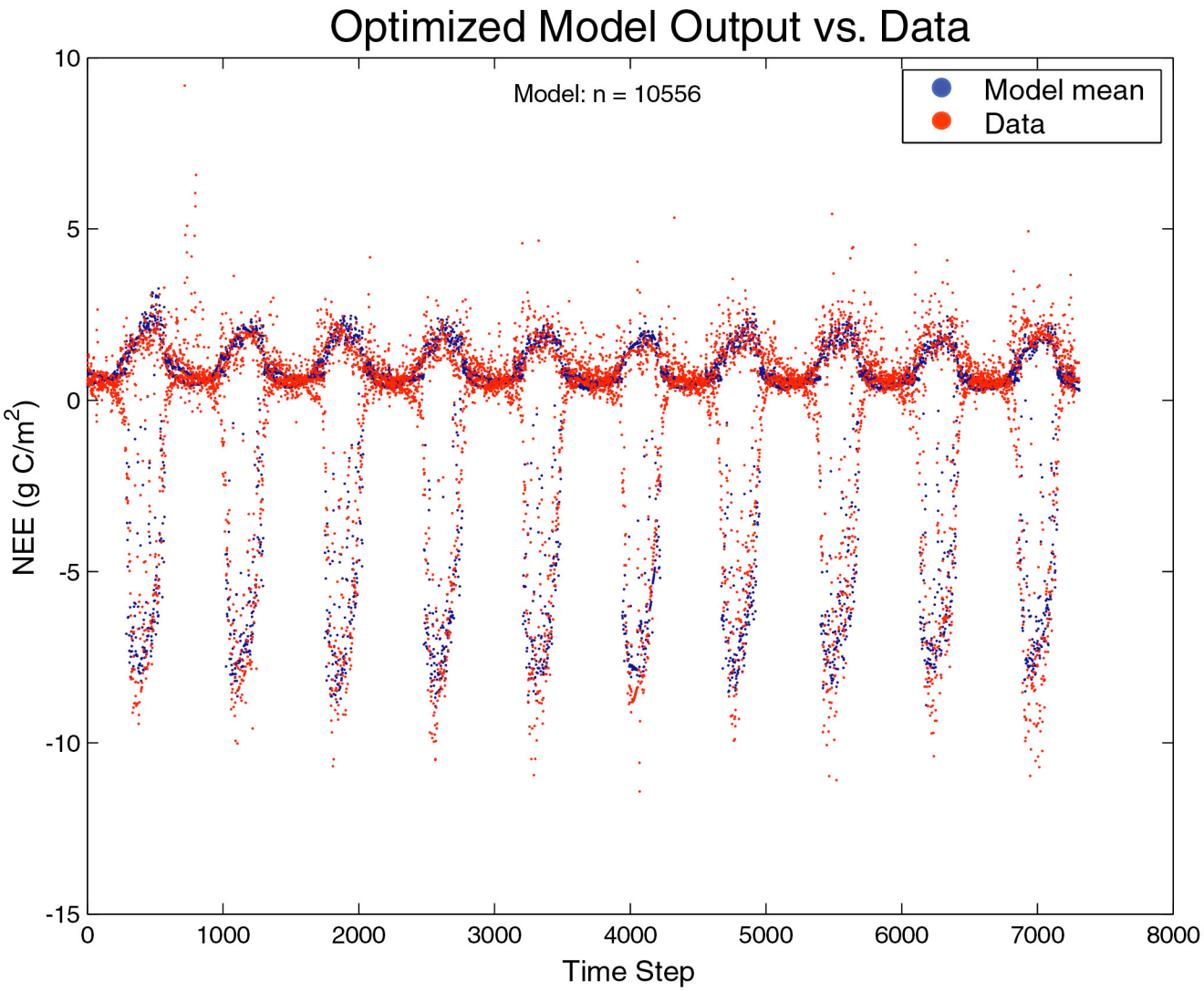
SPACENET Model Structure



1-D results - Harvard Forest




Initial Guess Model Output vs. Data
Model
Data
NEE (g C/m^2)
Time Step
10
5
0
-5
-10
-15
0
1000
2000
3000
4000
5000
6000
7000
8000


Optimized Model Output vs. Data
Model: n = 10556
Model mean
Data
NEE (g C/m2)
Time Step
10
5
0
-5
-10
-15
0
1000
2000
3000
4000
5000
6000
7000
8000

Model vs. Data: Unoptimized & Optimized Parameters

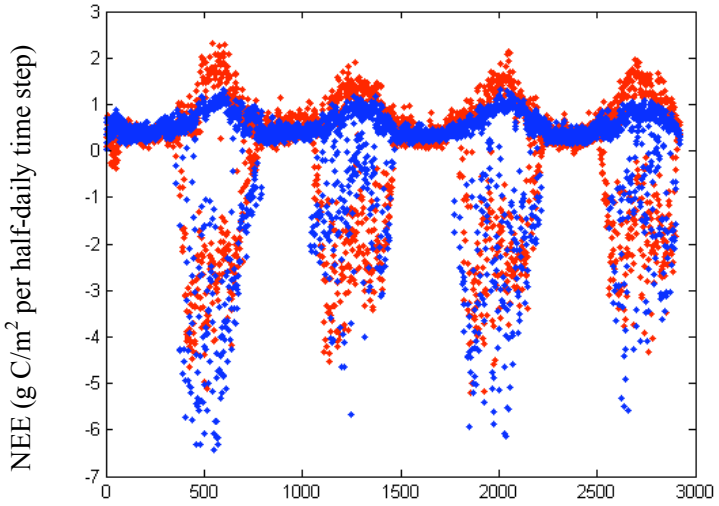
Blue: Model

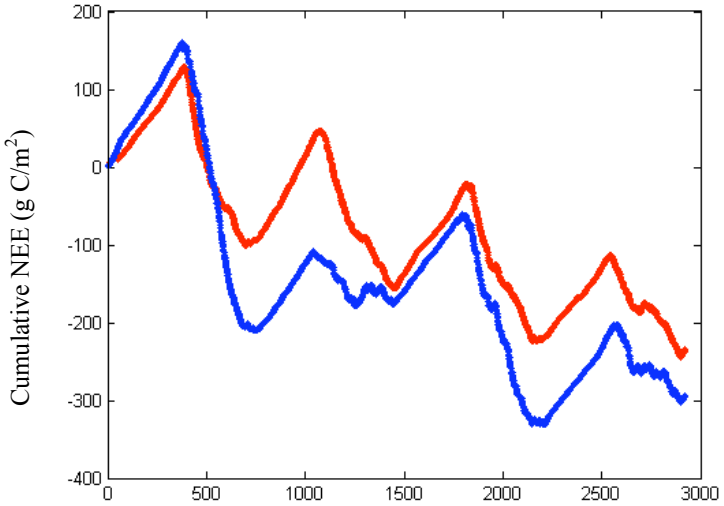
Red: Data

Dates: 11/1/98 – 10/31/02

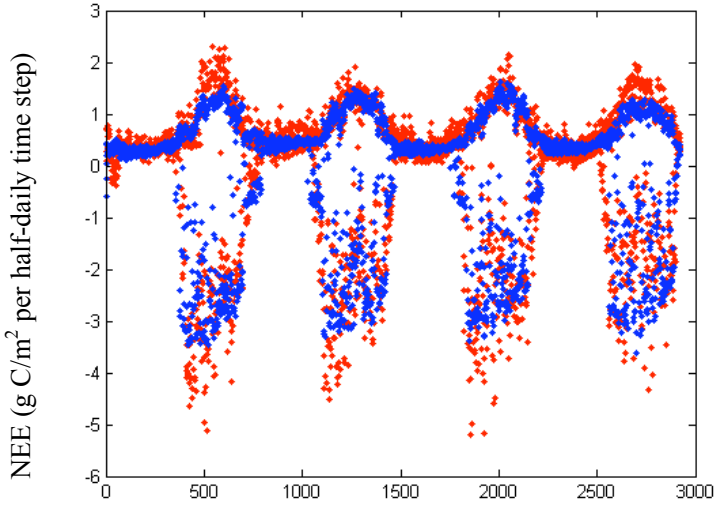
Each point represents one half-daily time step

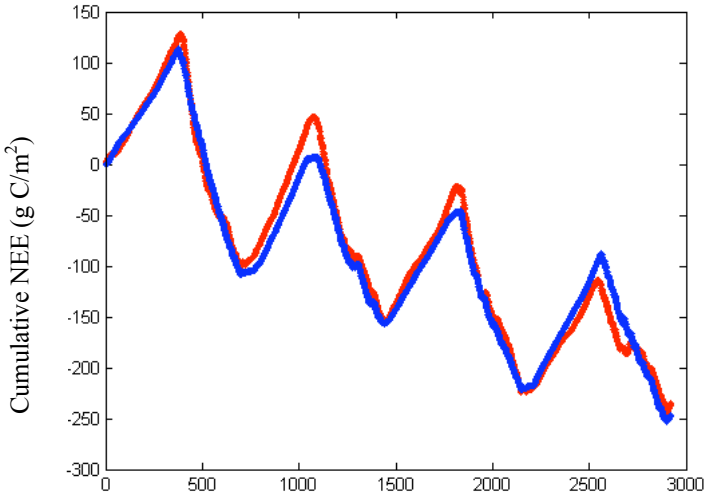
Initial guess parameters





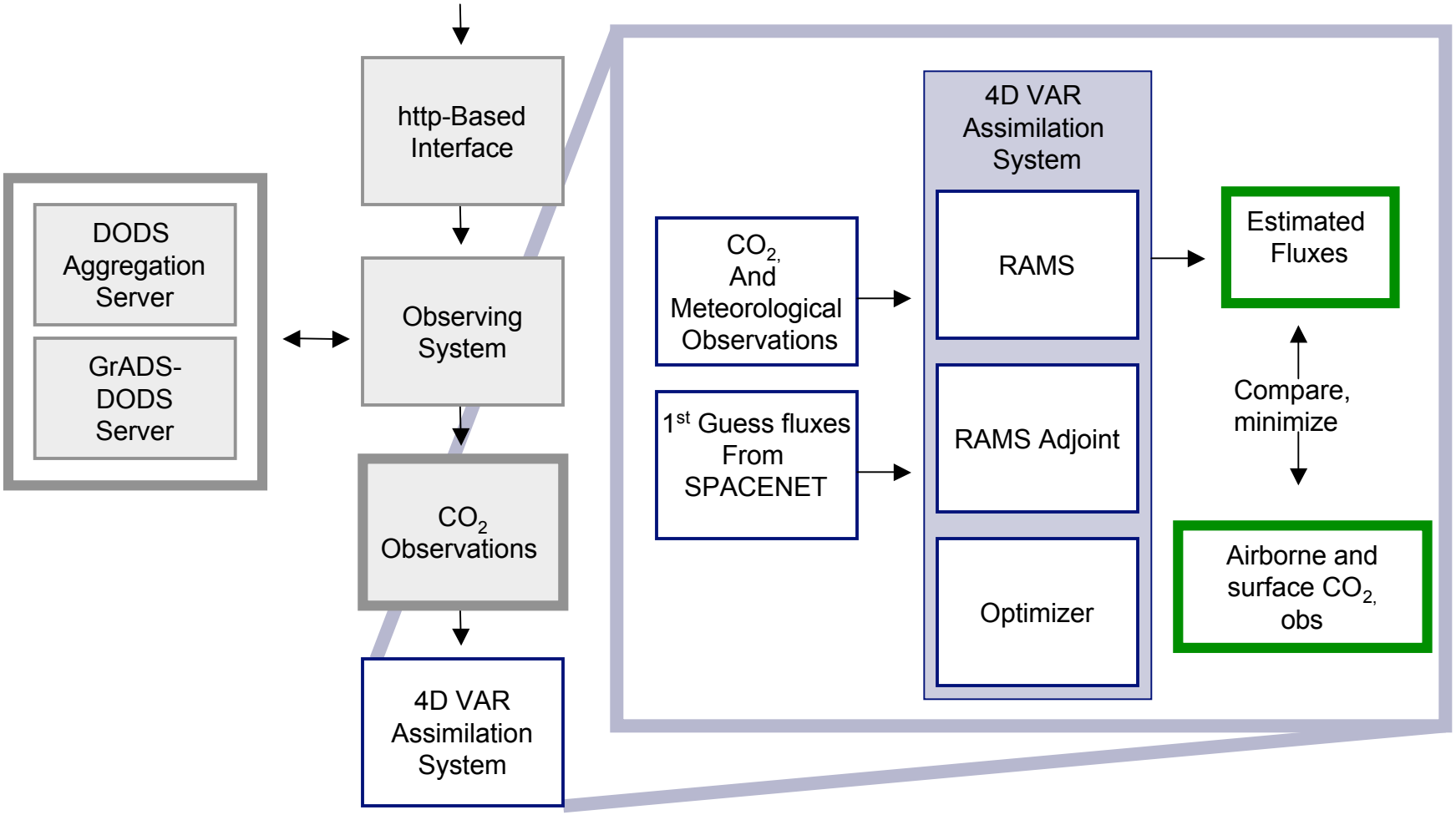
Optimized parameters





Regional carbon data assimilation system based on RAMS atmosphere model

Carbon Data-Model Assimilation (C-DAS)



http://dataportal.ucar.edu/CDAS/

Looking to the future - a regional BGS Front Range study

- Carbon issues
- Water issues
- Land use change
- Urbanization/ urban - rural interface
- Air quality
- A “regional” lab for method, instrument and sensor web development
- An opportunity for education and outreach (extend the IDEAS concept)

Timing: ACME-CME 2 in 2006-7 as a building block?
NACP Mountain Intensive
NEON