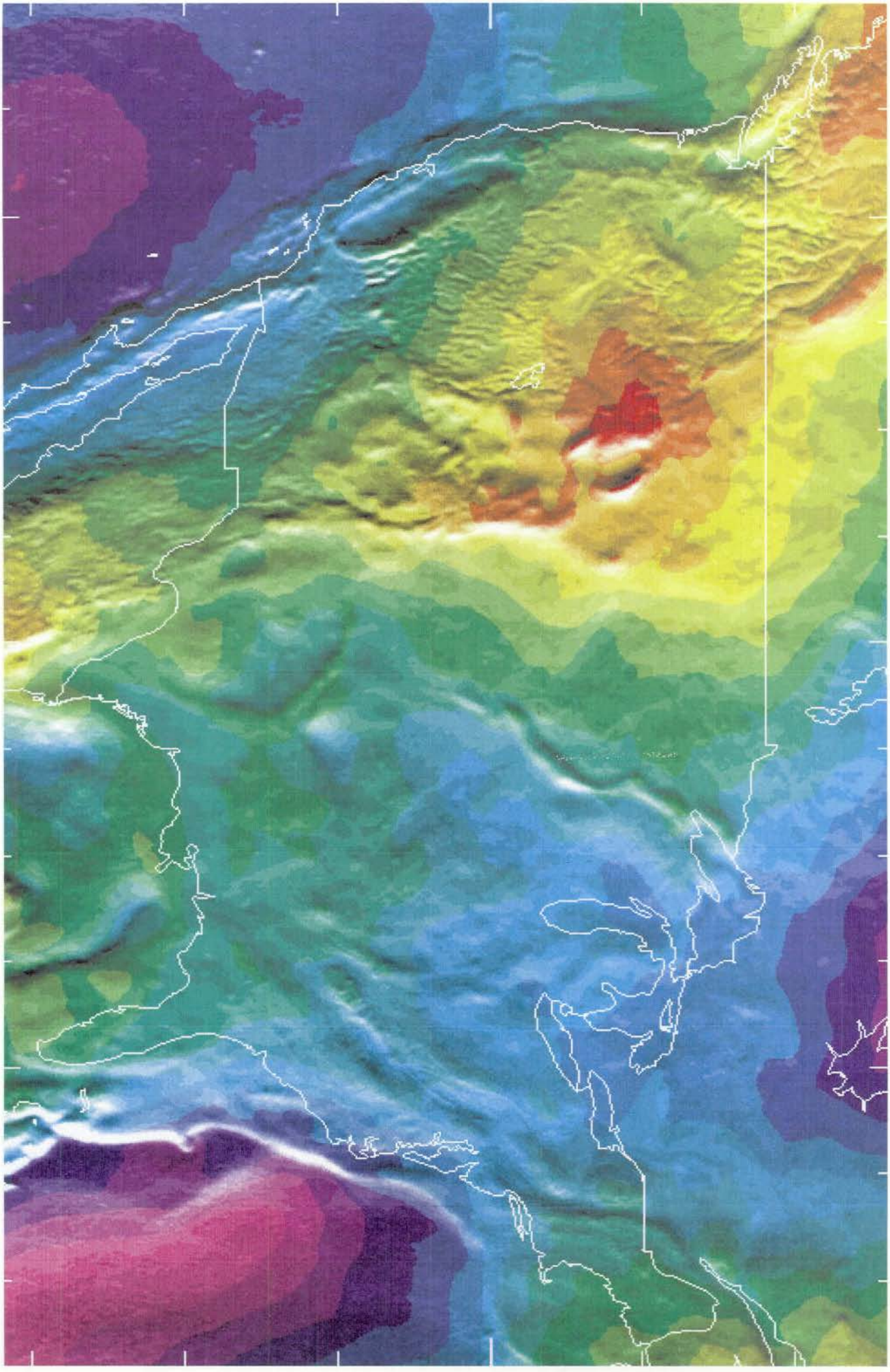
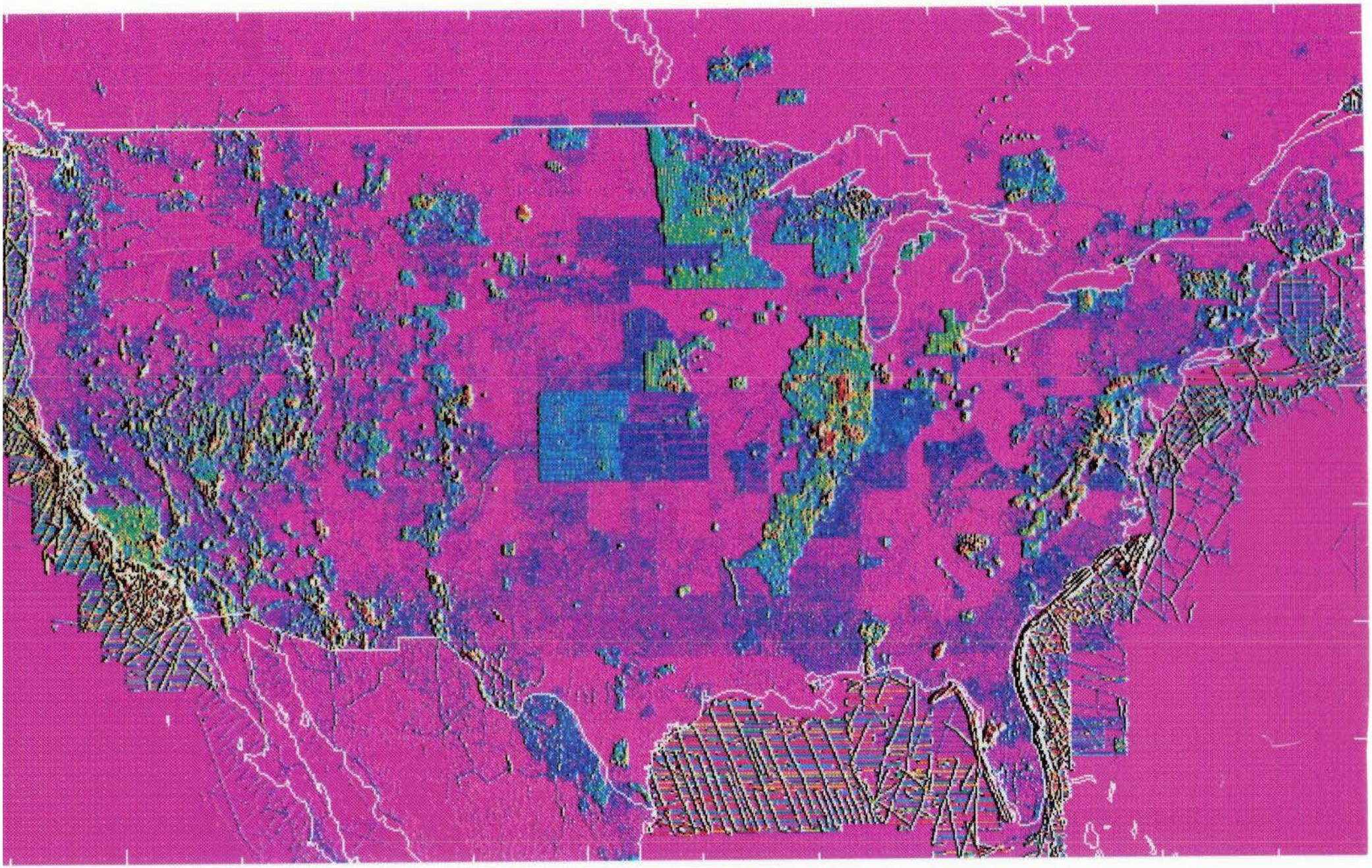
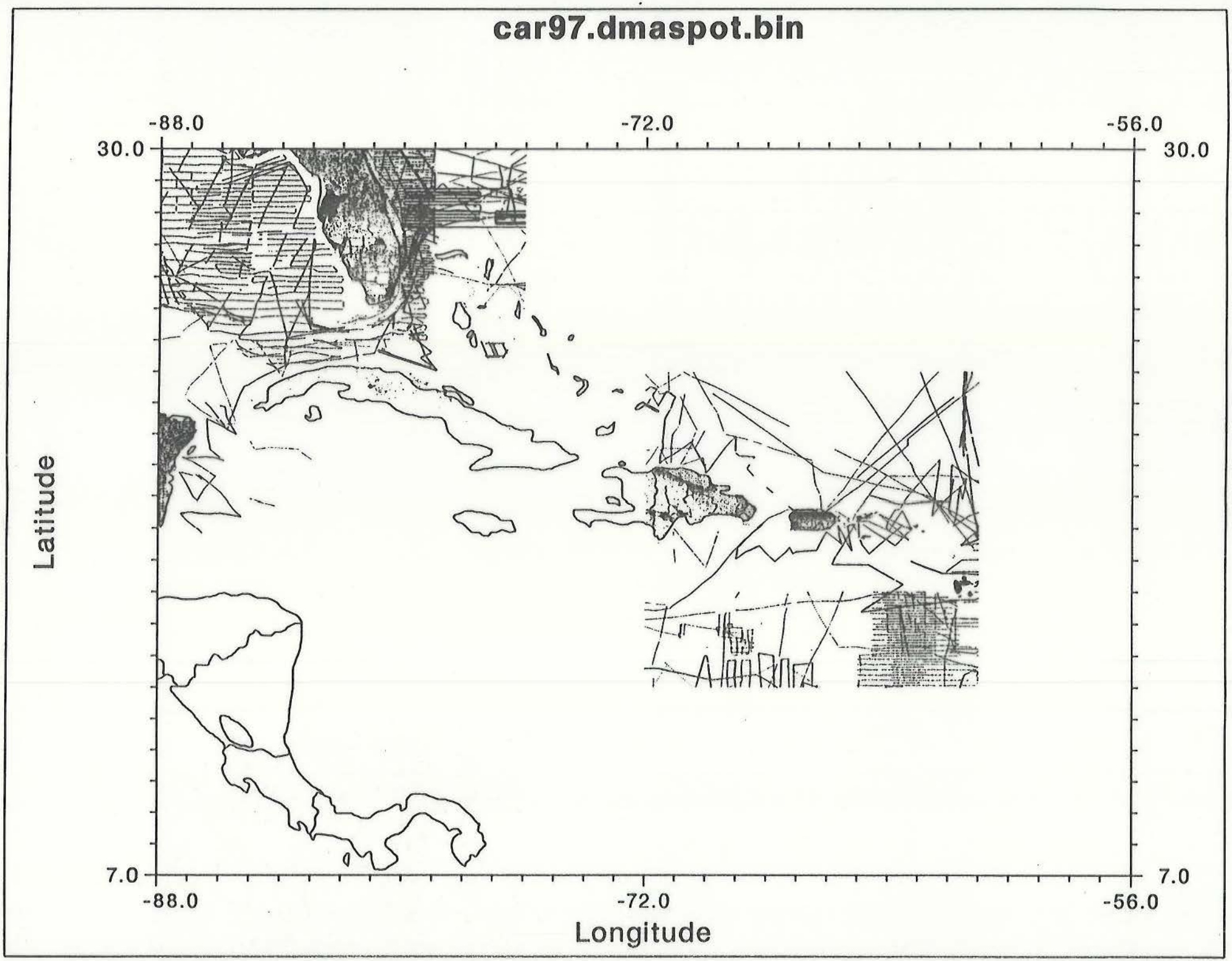
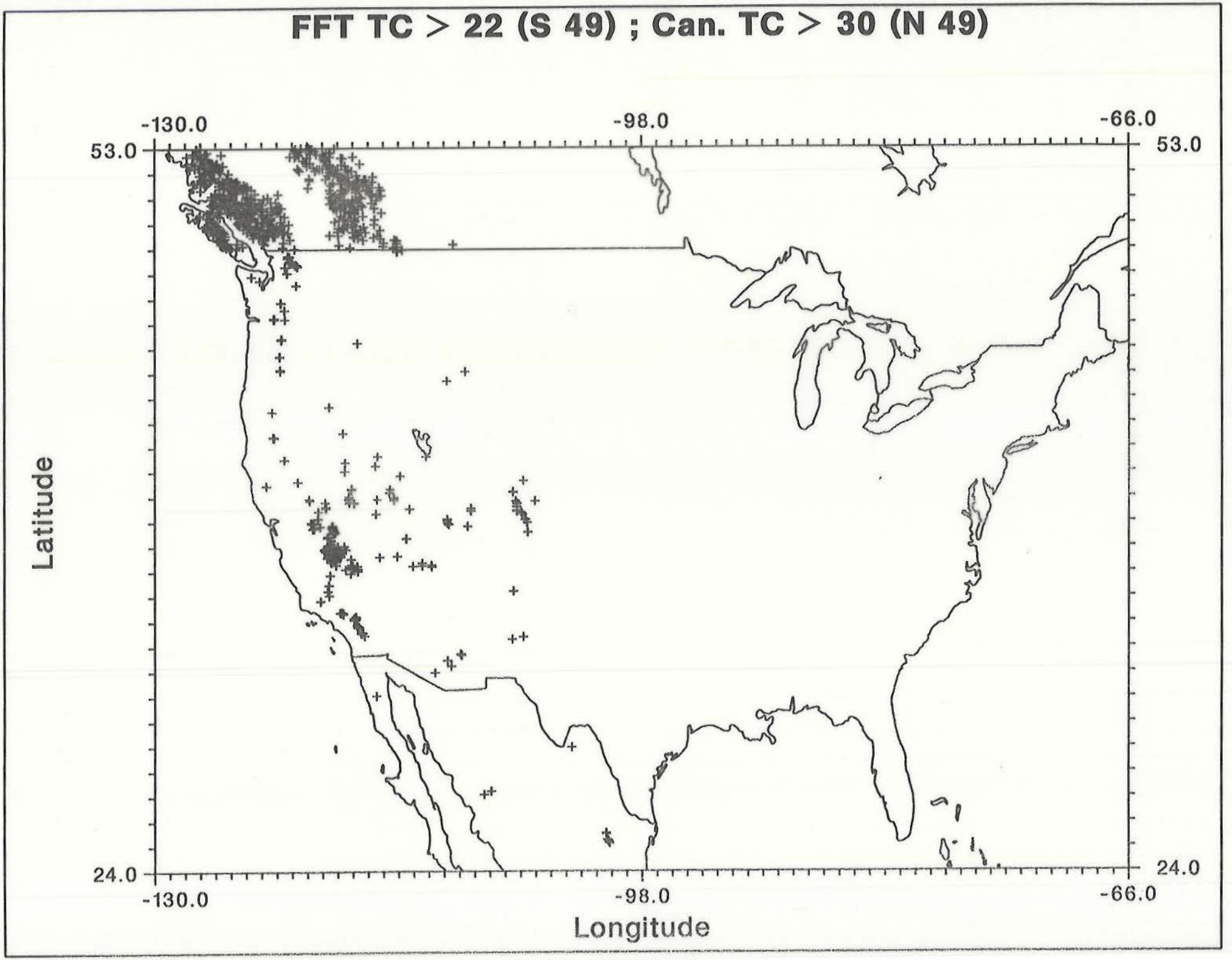





car97.dmaspot.bin
-88.0
-72.0
-56.0
30.0
30.0
7.0
7.0
-88.0
-72.0
-56.0
Latitude
Longitude

Car97. ngsboth.bin

→ NGS holdings, prior to Carib 97, 118,208 pts


FFT TC > 22 (S 49) ; Can. TC > 30 (N 49)
-130.0
-98.0
-66.0
53.0
53.0
24.0
24.0
-130.0
-98.0
-66.0
Latitude
Longitude

TC Plot #1

If FFT TCs have trouble replicating large (30+) TCs, by as much as 8 mgals

Then we shald see no difference between $TC_{FFT} > 22$ S of 49°

& $TC_{Can} > 30$ N of 49°

Since there is not a smooth transition, we assume that 8 mgals is too conservative of an estimate. FFT TCs are doing worse than 8 mgals error.

West to East Geoid Tilts across North America

G96SSS minus EGM96 (Bouguer corrected) Undulations:

24 to 53 N : + 30 cm

42 to 53 N : + 31 cm

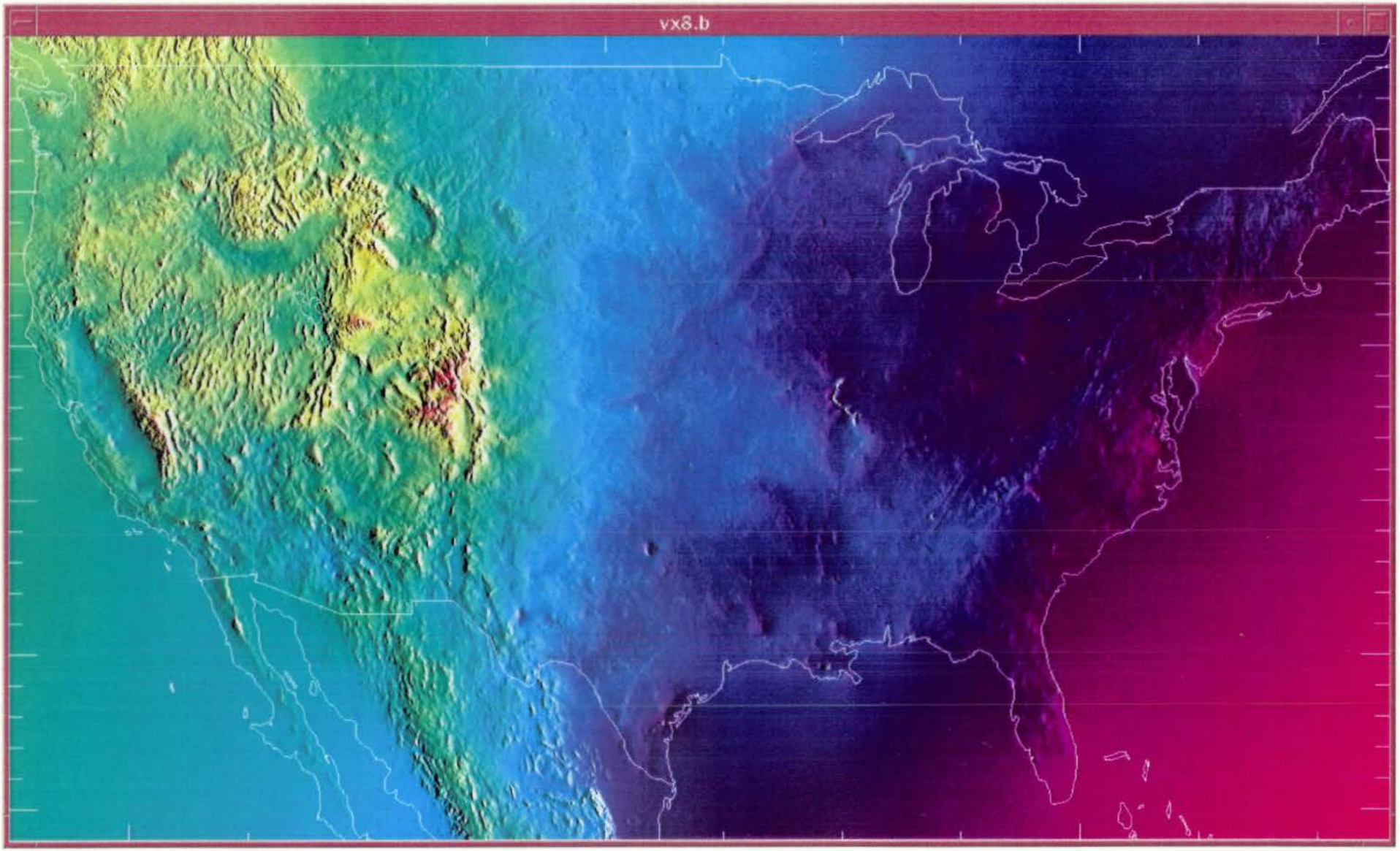
G96SSS minus ITRF94/NAVD88 (GPS/Benchmark) Undulations:

24 to 53 N: + 1 cm

42 to 53 N: + 0 cm

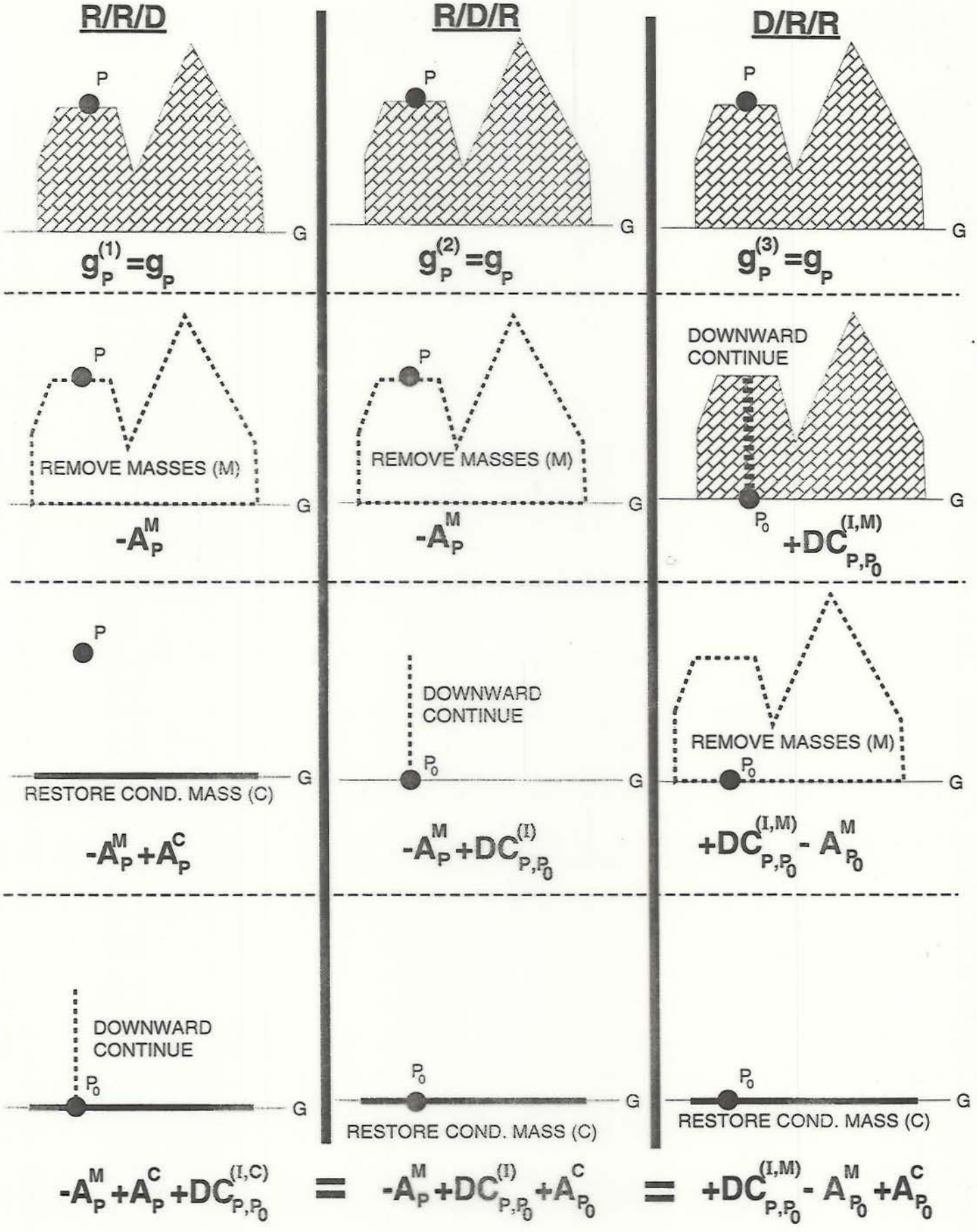
G96SSS minus GSD95 Undulations:

42 to 53 N: +125 cm


vx8.b

VertCon 2.0 (Vx8.6)

Min: -0.552 meters (FLA)
Max: +2.199 meters (Rockies)

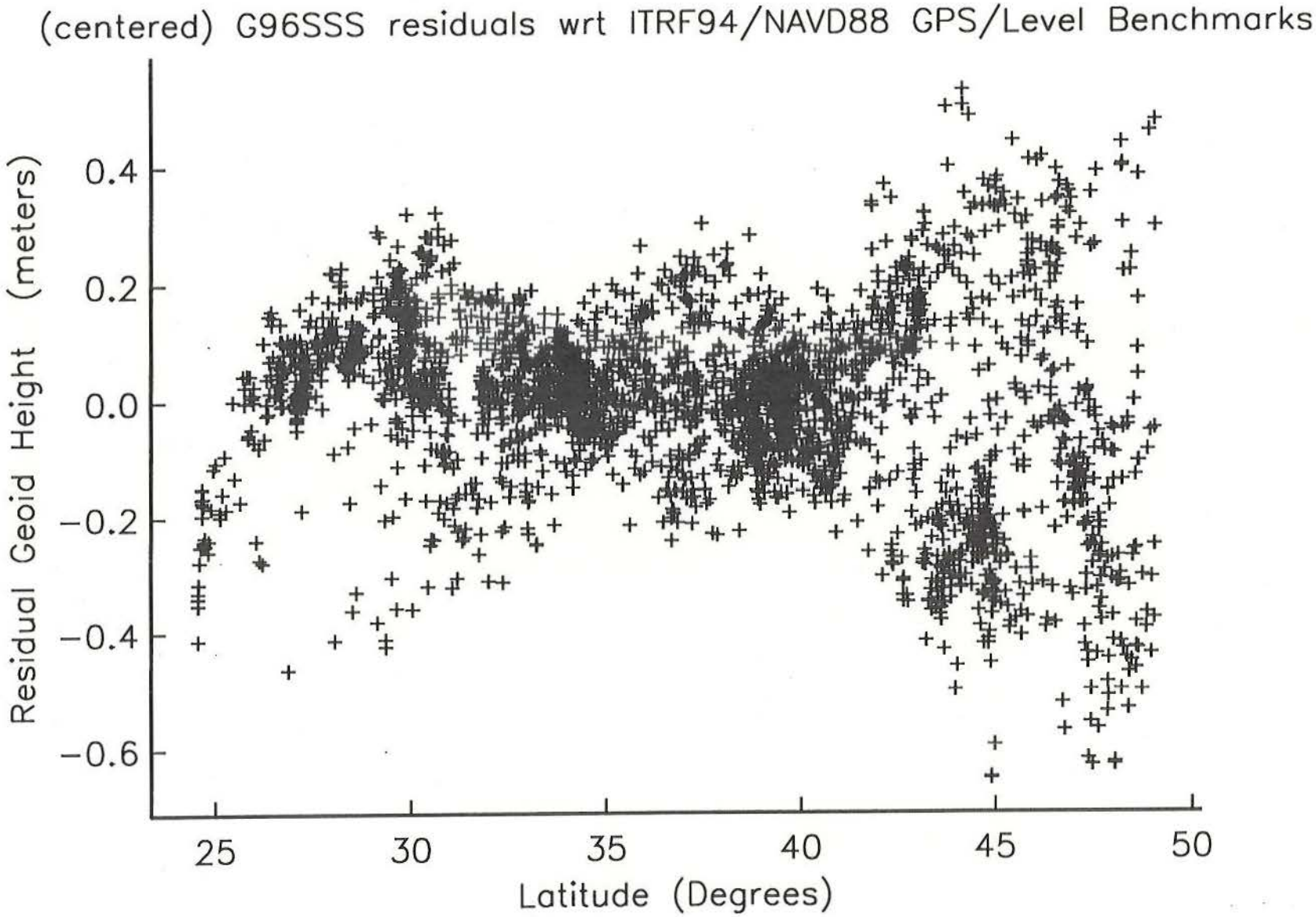

R/R/D
R/D/R
D/R/R
P
G
$g_P^{(1)} = g_P$
$g_P^{(2)} = g_P$
$g_P^{(3)} = g_P$
REMOVE MASSES (M)
$-A_P^M$
DOWNWARD CONTINUE
P_0
$+DC_{P,P_0}^{(I,M)}$
RESTORE COND. MASS (C)
$-A_P^M + A_P^C$
$-A_P^M + DC_{P,P_0}^{(I)}$
$+DC_{P,P_0}^{(I,M)} - A_{P_0}^M$
$-A_P^M + A_P^C + DC_{P,P_0}^{(I,C)} = -A_P^M + DC_{P,P_0}^{(I)} + A_{P_0}^C = +DC_{P,P_0}^{(I,M)} - A_{P_0}^M + A_{P_0}^C$

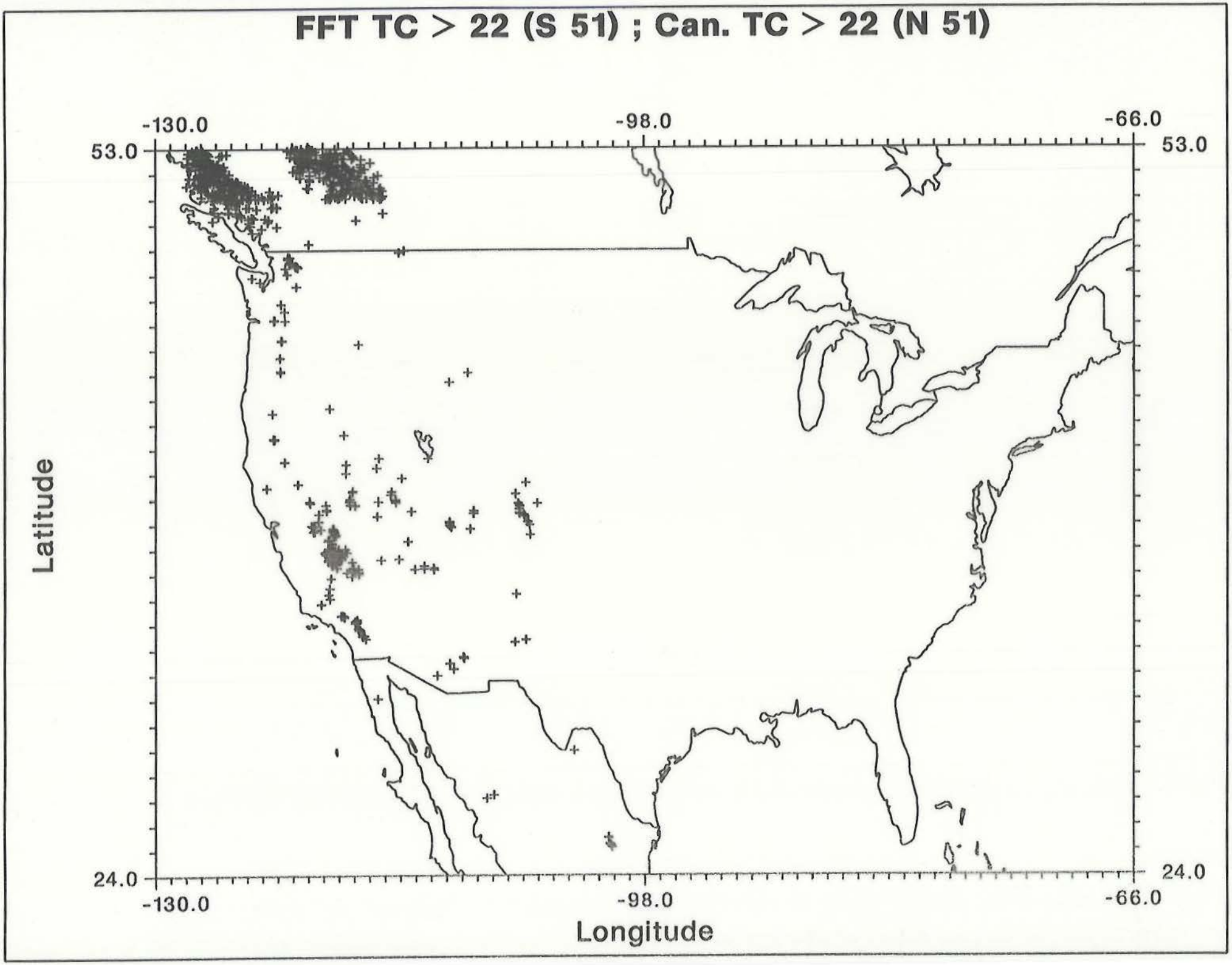
3 primary ways to do "Helmert's 2nd method of condensation"

R/D/R yields smoothest DC gradient

I, C, M (for D.C.) mean:

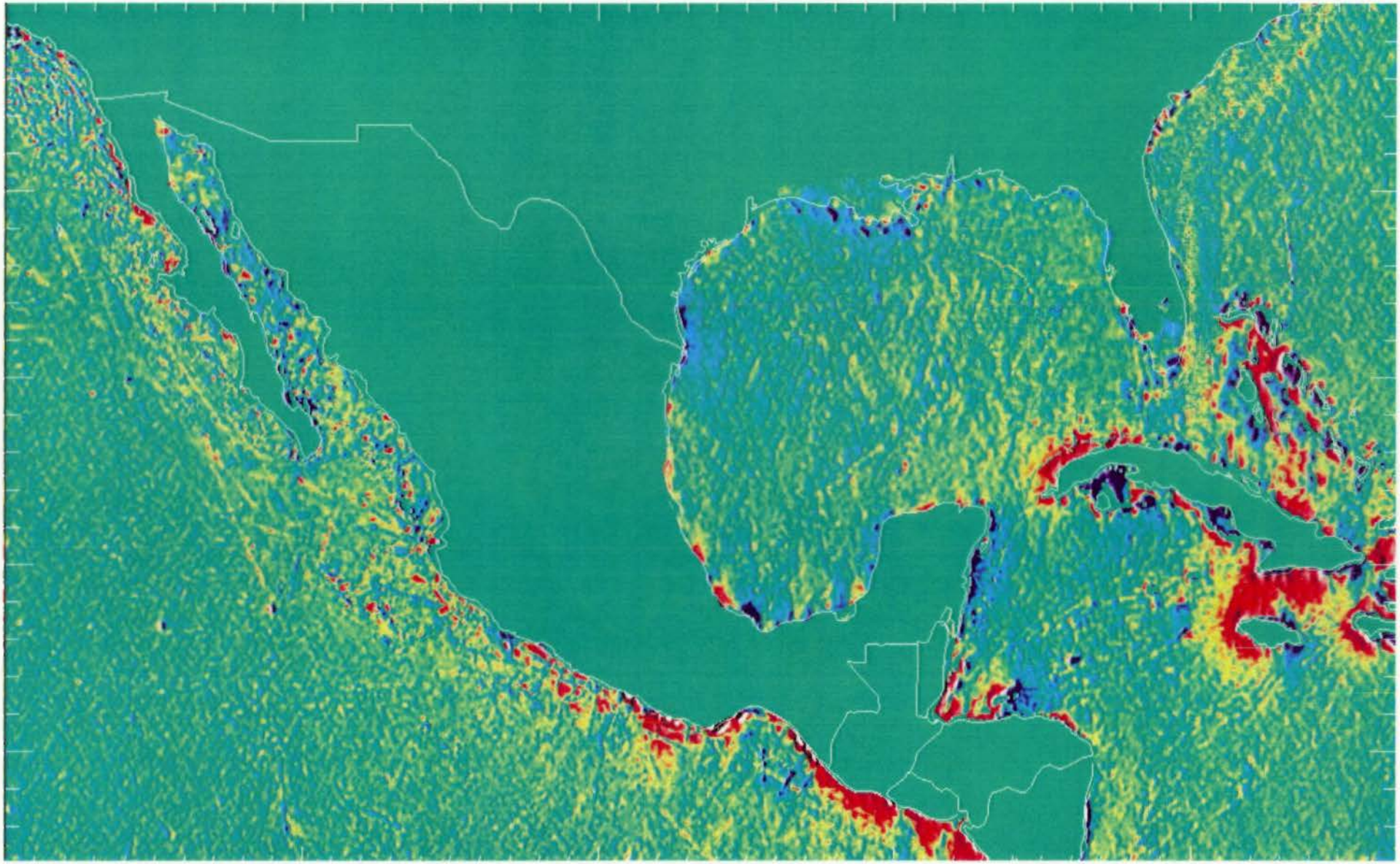
Internal masses (inside the geoid)
Condensed crustal masses
Masses from geoid to surface (crustal)


(centered) G96SSS residuals wrt ITRF94/NAVD88 GPS/Level Benchmarks
Residual Geoid Height (meters)
0.4
0.2
0.0
−0.2
−0.4
−0.6
25
30
35
40
45
50
Latitude (Degrees)


FFT TC > 22 (S 51) ; Can. TC > 22 (N 51)
-130.0
-98.0
-66.0
53.0
53.0
24.0
24.0
-130.0
-98.0
-66.0
Latitude
Longitude

TC plot #2

→ of interest here is the scarcity of TC >22 from 49° to 51°, in the P.N.W.



$\Delta g_{TB,\ MEXICO97} - \Delta g_{KMS}$

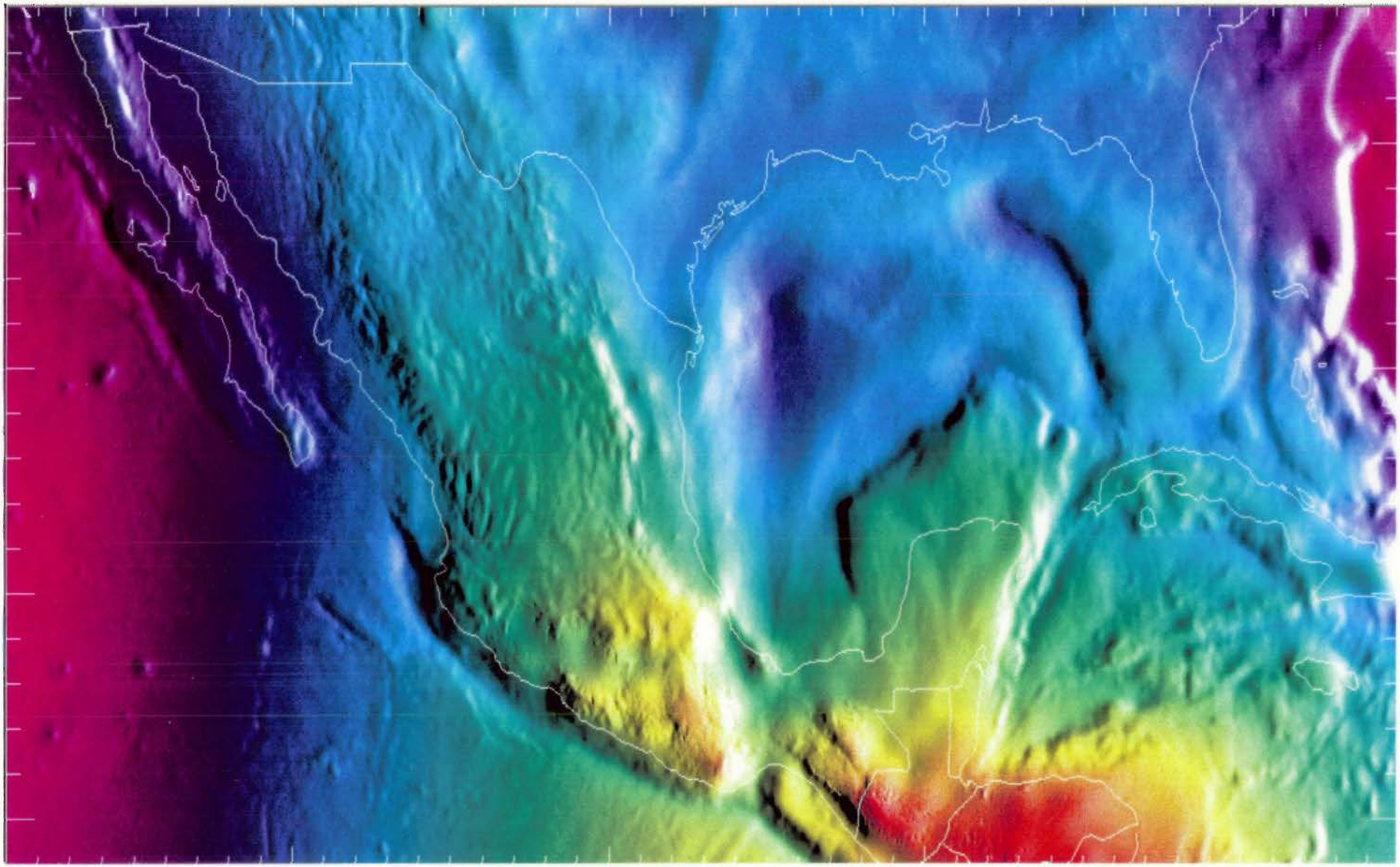
↳ EFFECTIVELY: $\boxed{\Delta g_{s/s\ 7.2} - \Delta g_{KMS}}$

$\pm$ 20 mgals

(Deltas $\pm$25)

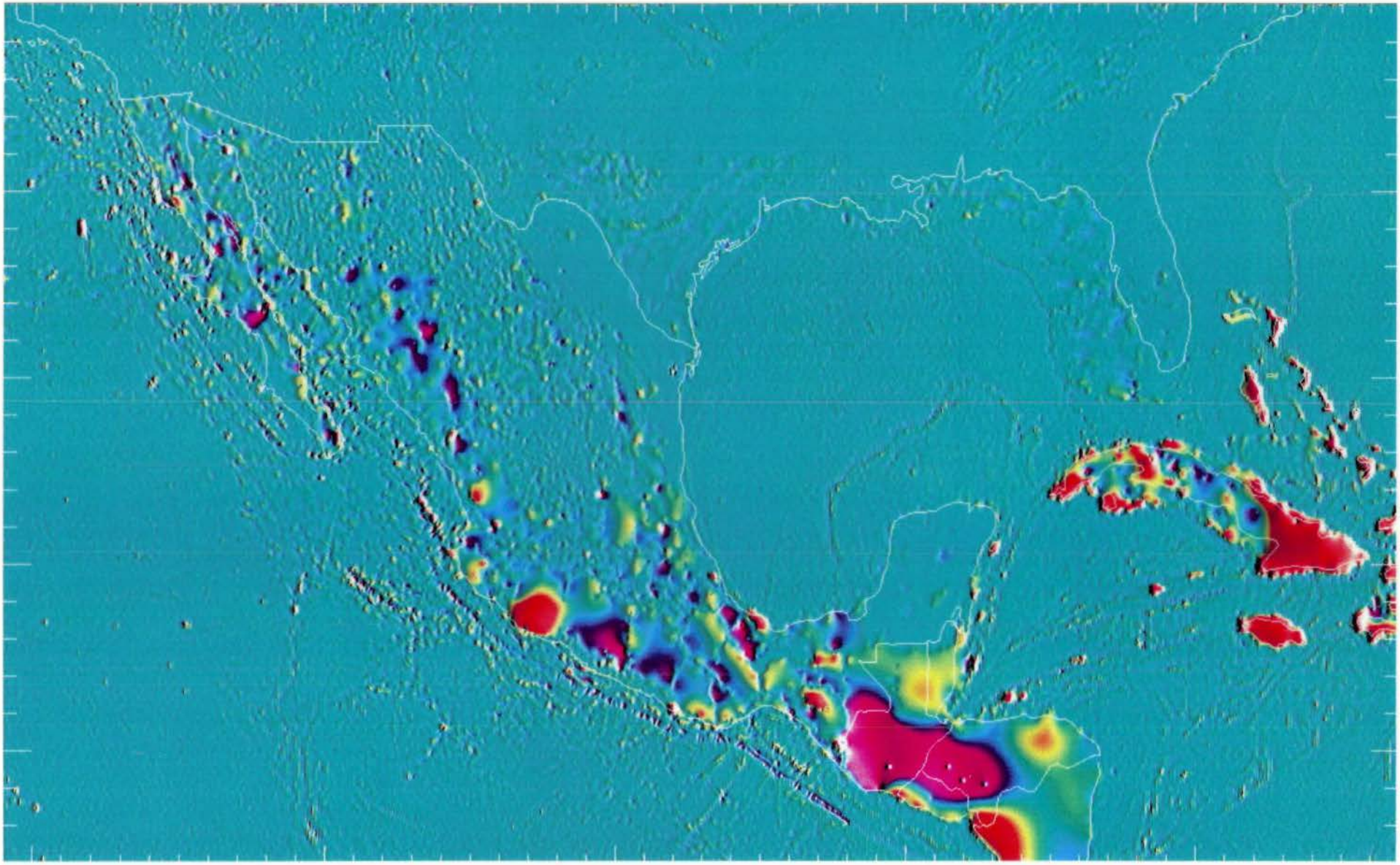
Areas of "KMS causing improvement" : Texas / Louisiana Coast (s/s 7.2 too low)
Cubas NW Coast (s/s 7.2 too high)

Areas of Questionable improvement : Bahamas
Cuba / Jamaica strait
West Coast of Mexico



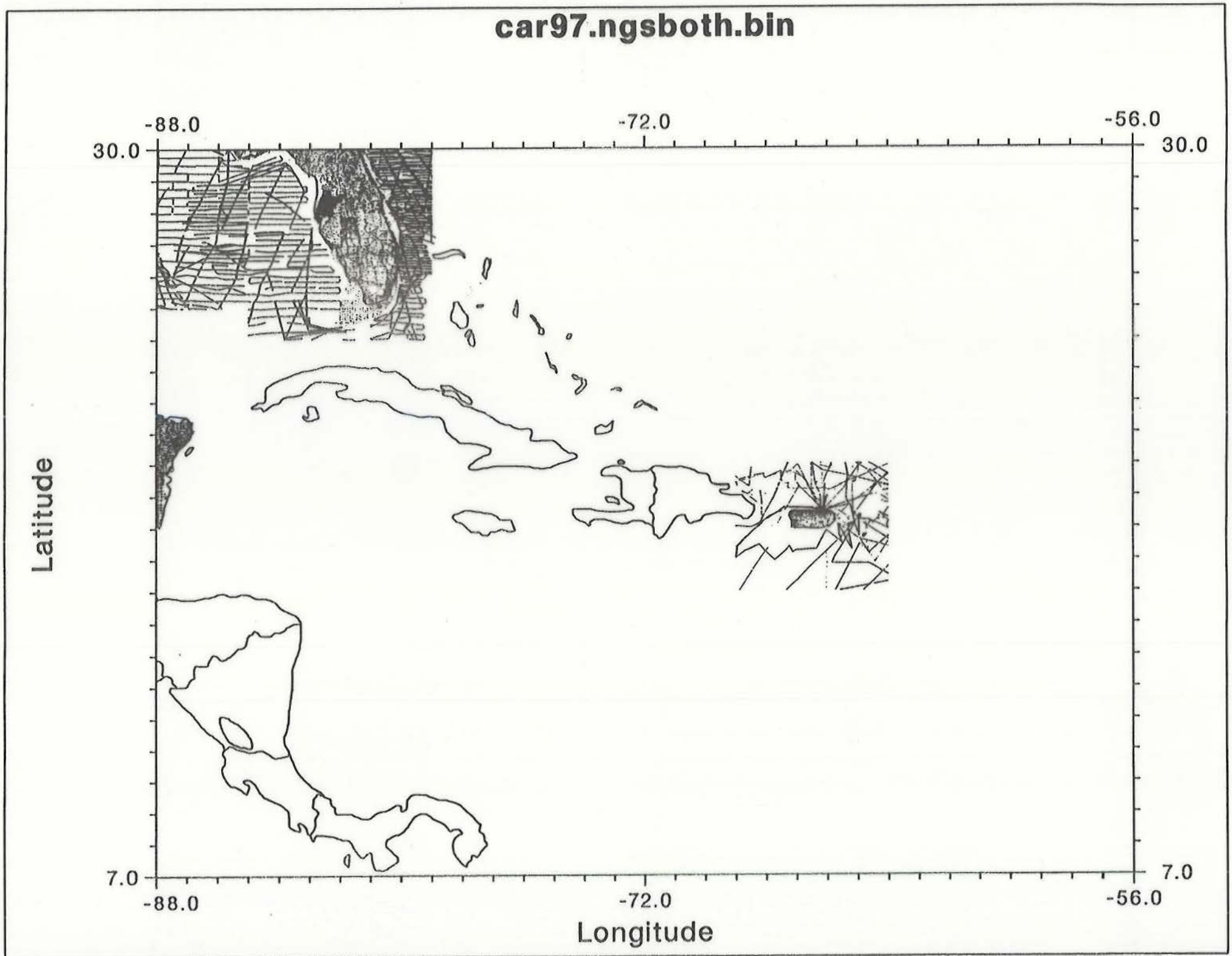
Mexico 97

Min - 48
Max + 7
(deltas ± 0.35)



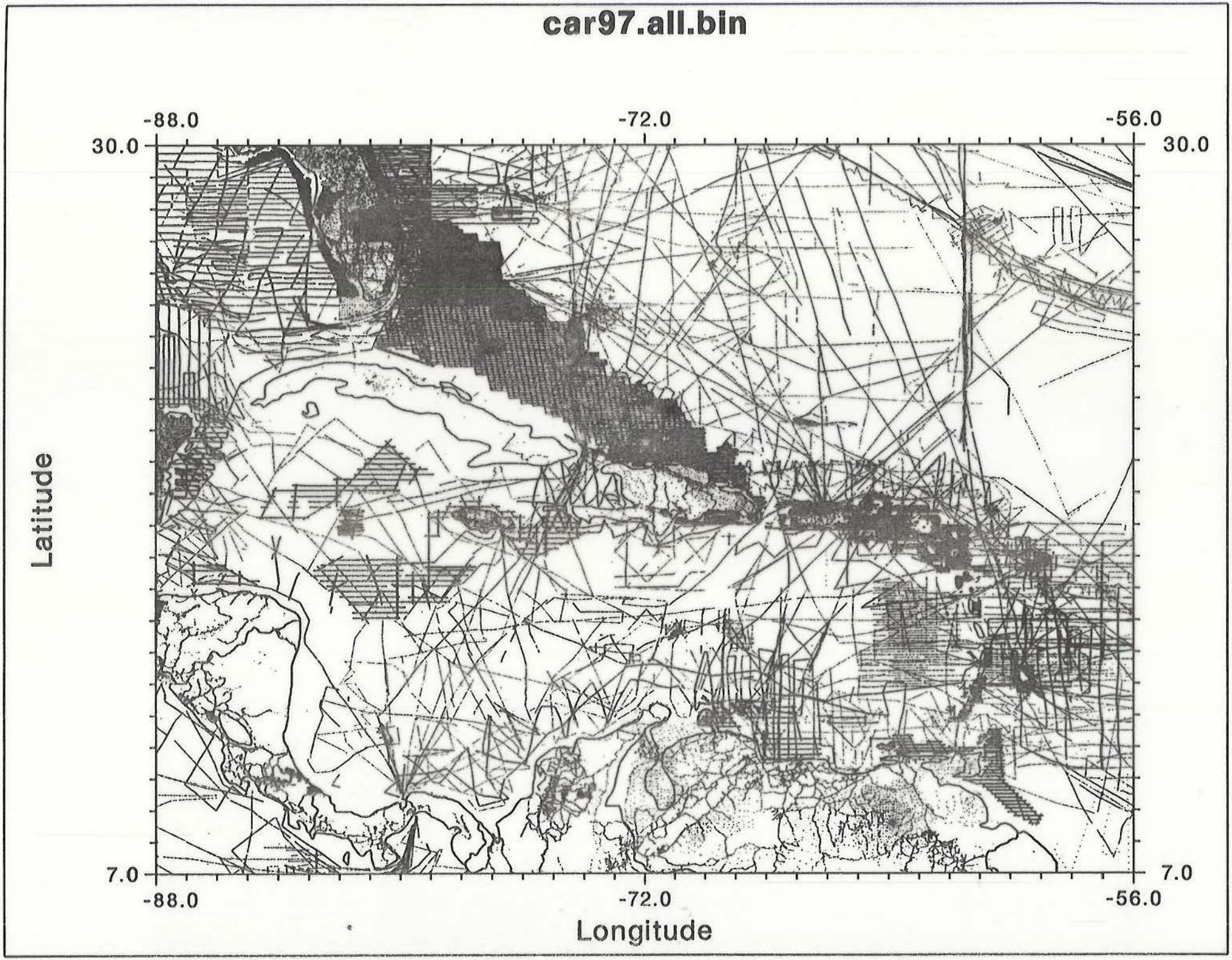
dif. mex 97-8. nosyn. t025 - t075. ba. b

- Difference in griddings Δg_{TB} using T = 0.25 minus using T = 0.75
- No "synthetic" fill-ins for data gaps
- Colors ± 10 (delta ± 3)
- Full Range : −32 mgals (Guatemala)
  + 51 mgals (Cuba)


car97.ngsboth.bin
-88.0
-72.0
-56.0
30.0
30.0
Latitude
7.0
7.0
-88.0
-72.0
-56.0
Longitude

Caribbean Transport: Bin

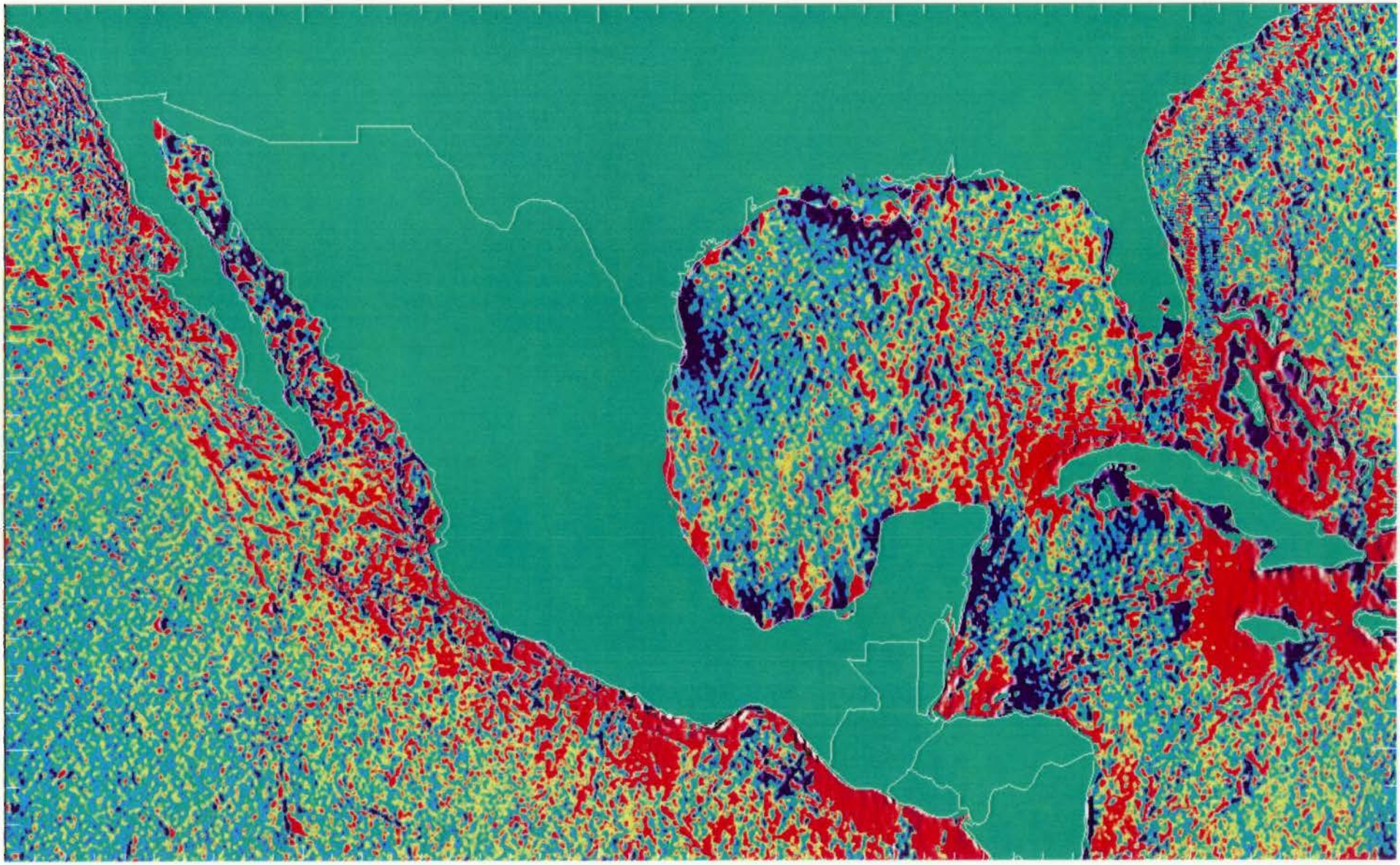
→ NGS holdings of NIMA releasable eval. data,
prior to Carib97. 89,032 pts


car97.all.bin
-88.0
-72.0
-56.0
30.0
7.0
Latitude
Longitude

Comparison

→ Combined NGS/NIMA holdings going into Carib97

620,821 pts



$\Delta g_{TB,\ MEXICO\ 97} - \Delta g_{KMS}$

↳ EFFECTIVELY : $\boxed{\Delta g_{S/S\ 7.2} - \Delta g_{KMS}}$

± 5 mgals

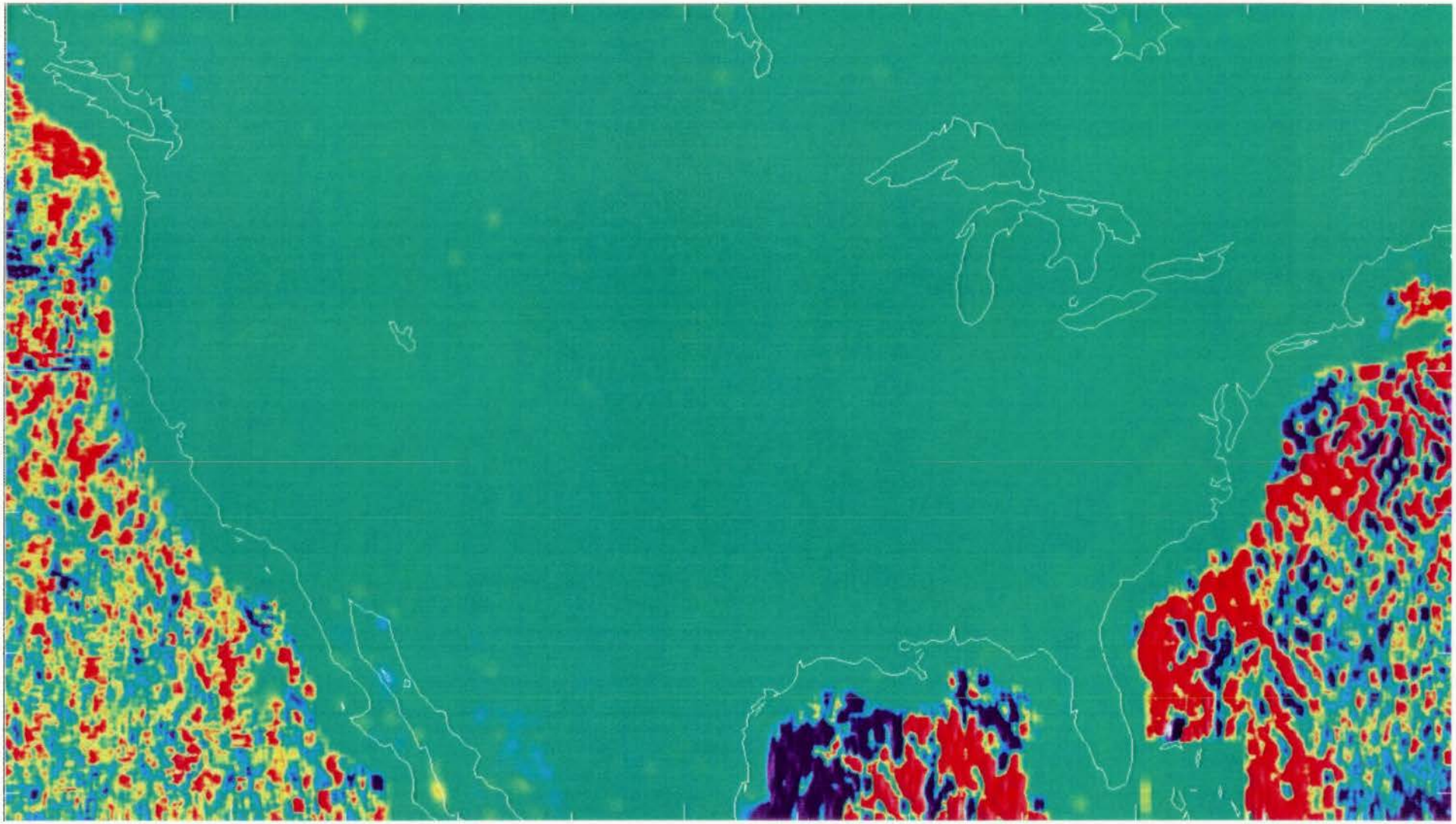
(Deltas ± 25)

(See other sheet for geographical discussion)

KMS improves Tx Louisiana coast (SS 7.2 too low)

Cuban NW coast (SS 7.2 too high)

Large areas of systematic differences

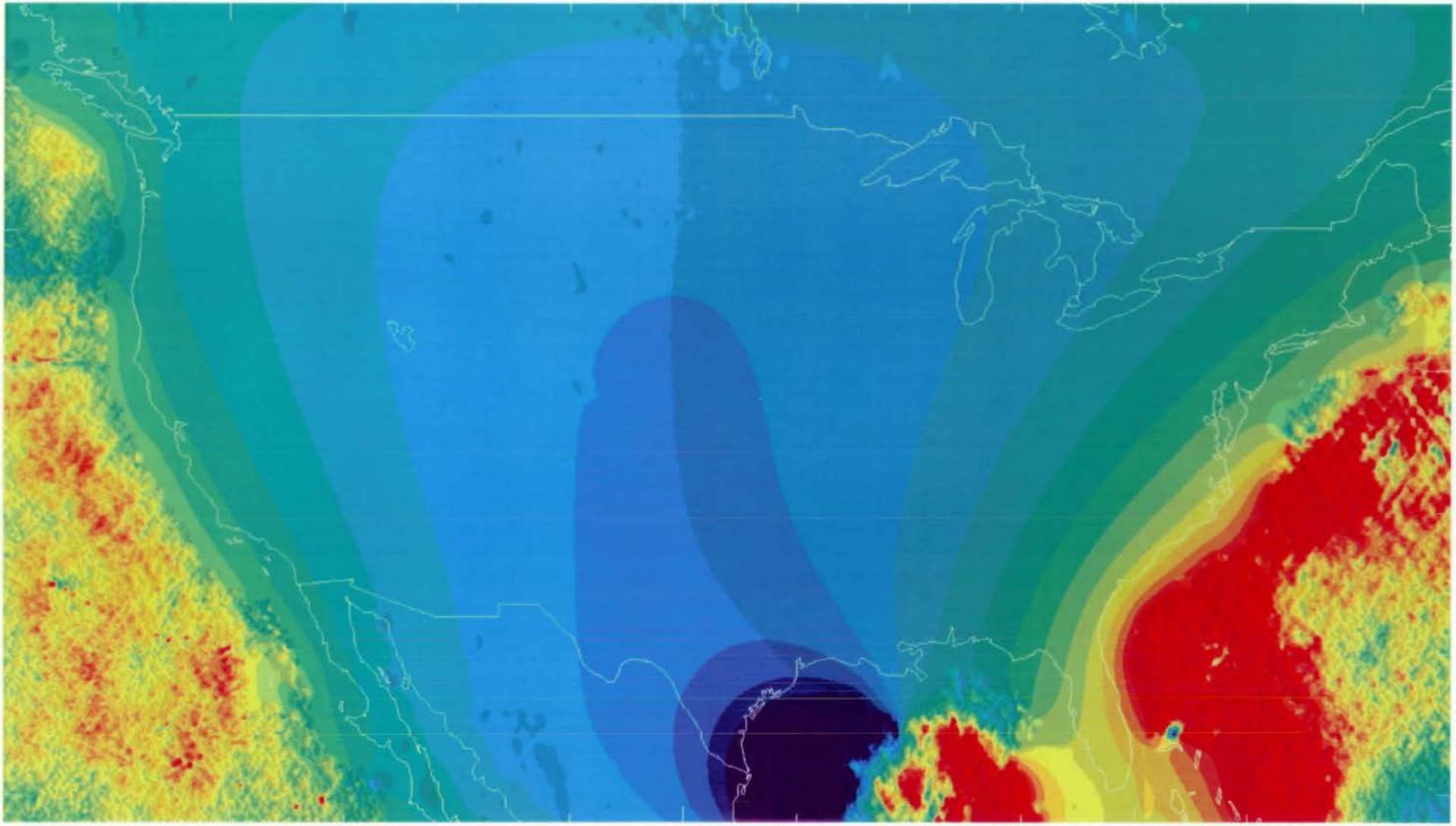


$\Delta g_{ss/7.2} - \Delta g_{KMS}$

- Colors ± 1 mgal
- ~~(Delta 3~~
- Averaged w/ Running Average filter 30' x 30'
- Bahamas Not Included in study
- 50 Km offshore
- 200 m deep

} Believable altimetry from both data sets.

And, they're still Different.



$N(\Delta g_{SS/7.2}) - N(\Delta g_{KMS})$

about 4 cm per hve contour

- Colors ± 20 cm
- Real Range: −54 cm (West Gulf)
  +44 cm (East of Bahamas)

- Slopes: Tx to CA: 0.11 ppm
  FL to MN: 0.05
  E Coast 0.28
  W Coast 0.16

	TX TO CA	FL to MN	E coast	W coast
- SS 7.2 Geoid vs GPS BMs:	~~Tx to CA: 0.35 ppm~~ 0.35 ppm	0.23	0.88	0.60
- KMS Geoid vs GPS BMs:	0.30	0.25	0.64	0.49

Geoid Differences -- SS7.2 vs. KMS Altimetry

Range: -54 cm (west Gulf) to +44 cm (east of Bahamas)

Regional differences:

TX to CA	0.11 ppm
FL to MN	0.05 ppm
E coast	0.28 ppm
W coast	0.16 ppm

Compare against GPS Benchmarks (units of ppm)

	TX to CA	FL to MN	E coast	W coast
SS 7.2	0.35	0.23	0.88	0.60
KMS	0.30	0.25	0.64	0.49


dif.dma_usgs.3sec.004.b

d.f. dma_usgs.3sec.004.b

DMA DTED Level 1 minus USGS 3" DEM 5° x 6° area, Pacific NW

"NEW" "OLD"

- 3 sorts of agreement:

1) North Edge: 5 cells show no change, except a slope on their South edges

2) Central Blocks: ≈20 meter bias applied

~+11 meters added (incorrectly) to Lake Level after Dam installed

~ 0 meter agreement on South area .... no idea why.

3) All other cells: show high frequency changes, indicating an update @ NIMA.

Biggest Problem: No Care for Vertical Datum Consistency

Colors: ± 20 meters

TrueRange: -484 meters

+487 meters

($\bar{x}$ = 0.15 m, σ = ±27 m)