Finding and Defining the Edges of Stable North America: Reference Frame Effects vs. Real Tectonics

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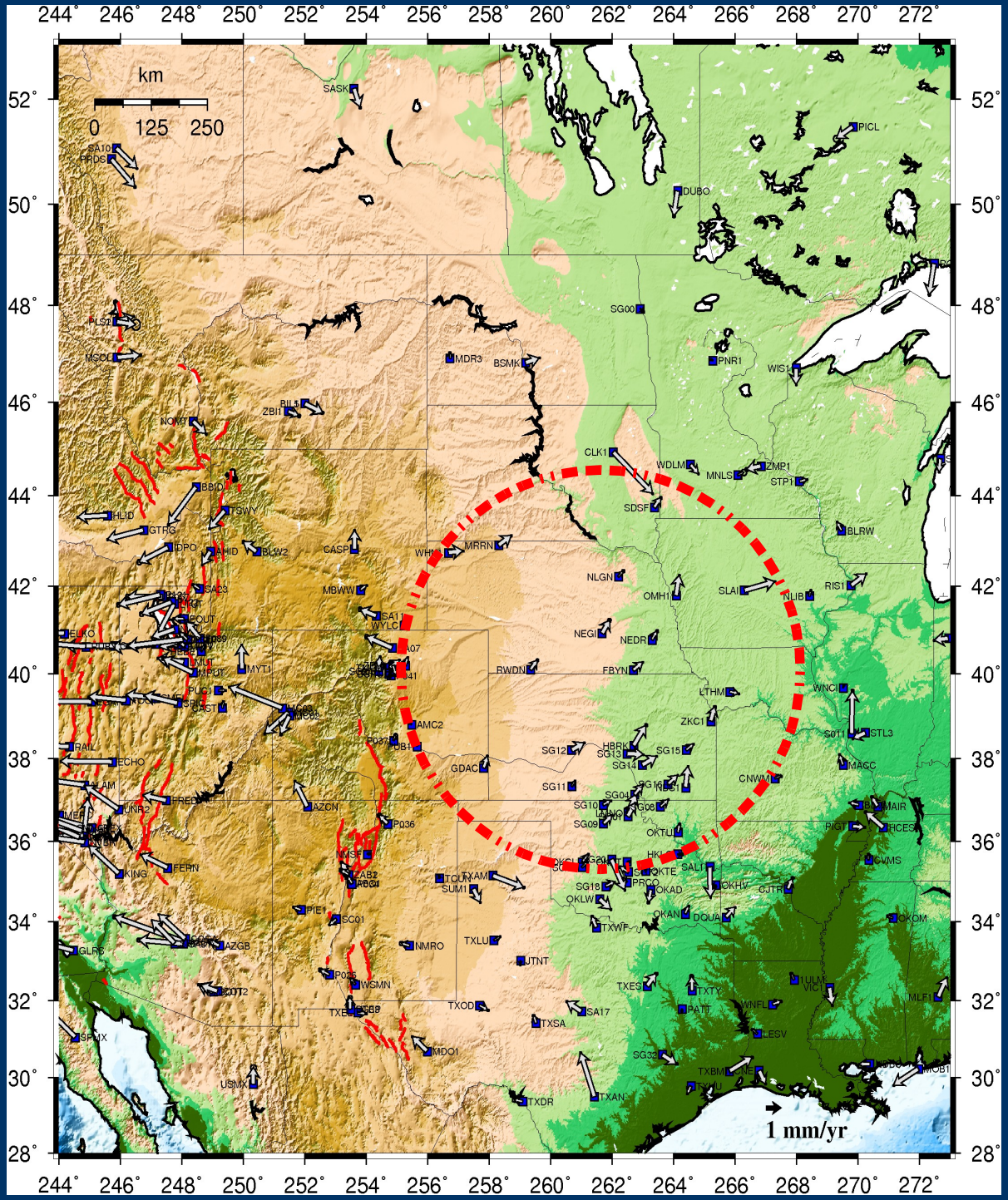
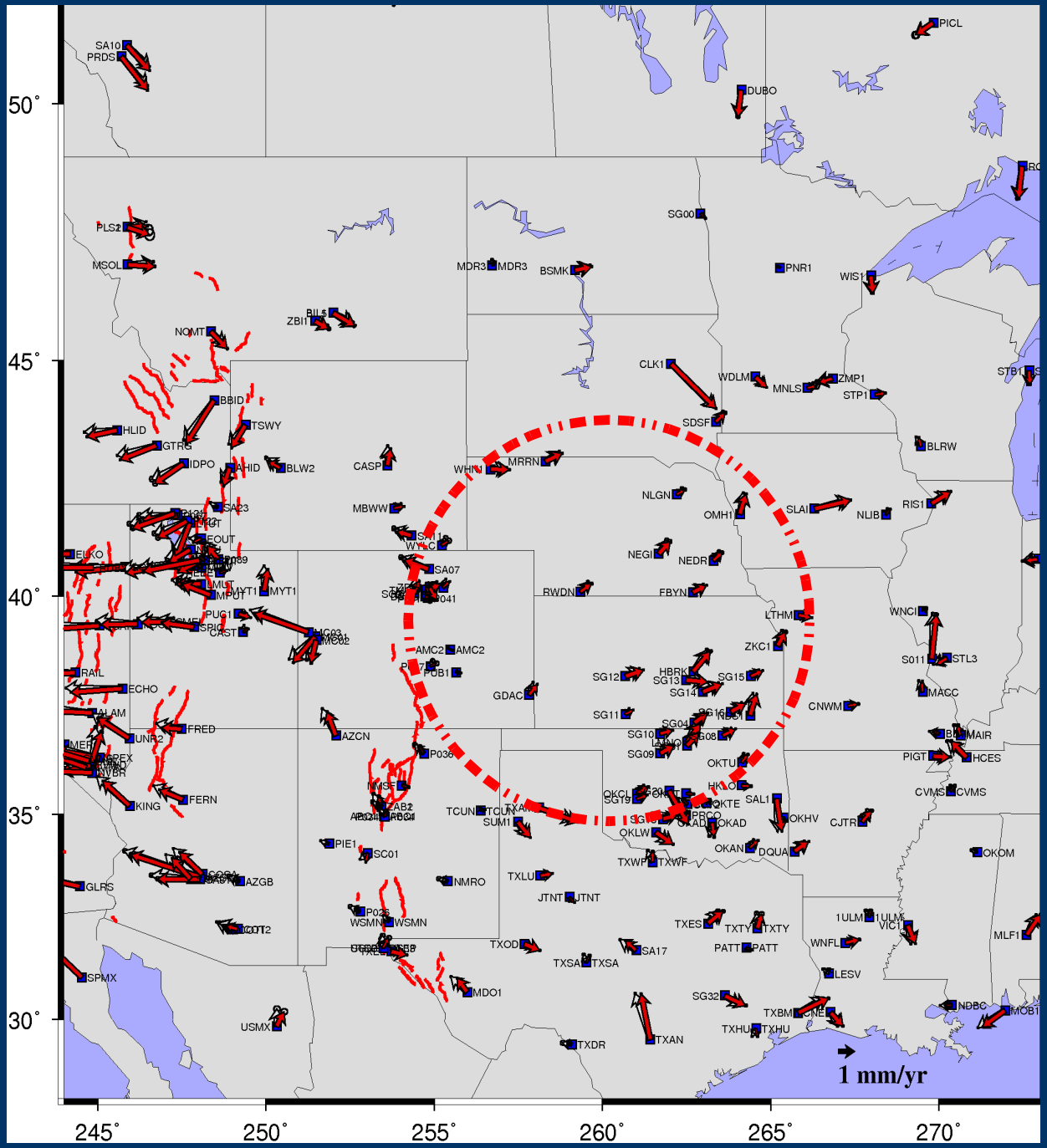


Velocities Relative to SNARF

ITRF velocities rotated onto official SNARF velocities at 84 common sites

Unexplained anomalous NNE motion of the Great Plains (see also Calais et al., 2006)

Testing SNARF



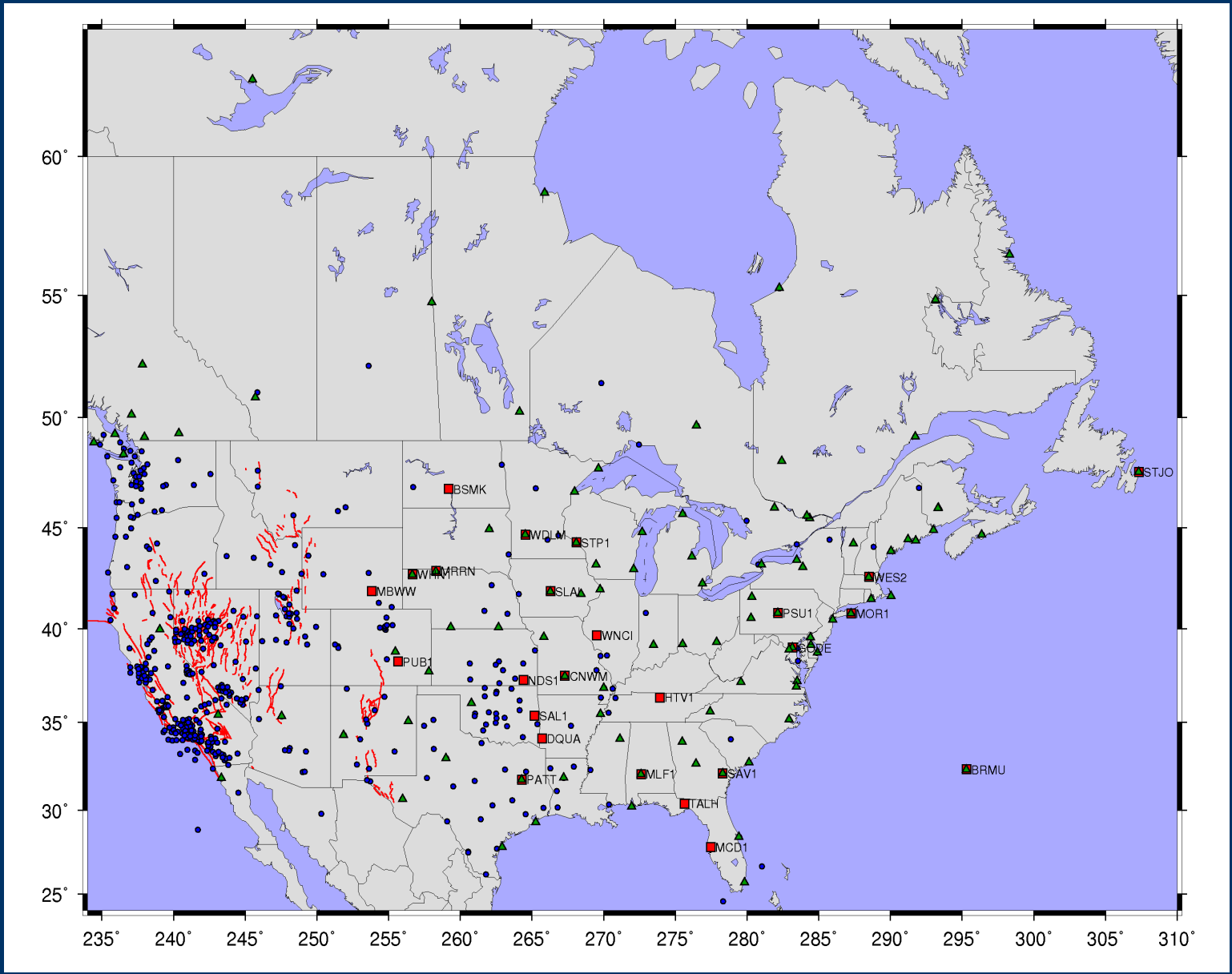
Is anomalous motion result of how transformation to SNARF is made ?

Unexplained anomalous NNE motion of the Great Plains (see also Calais et al., 2006)

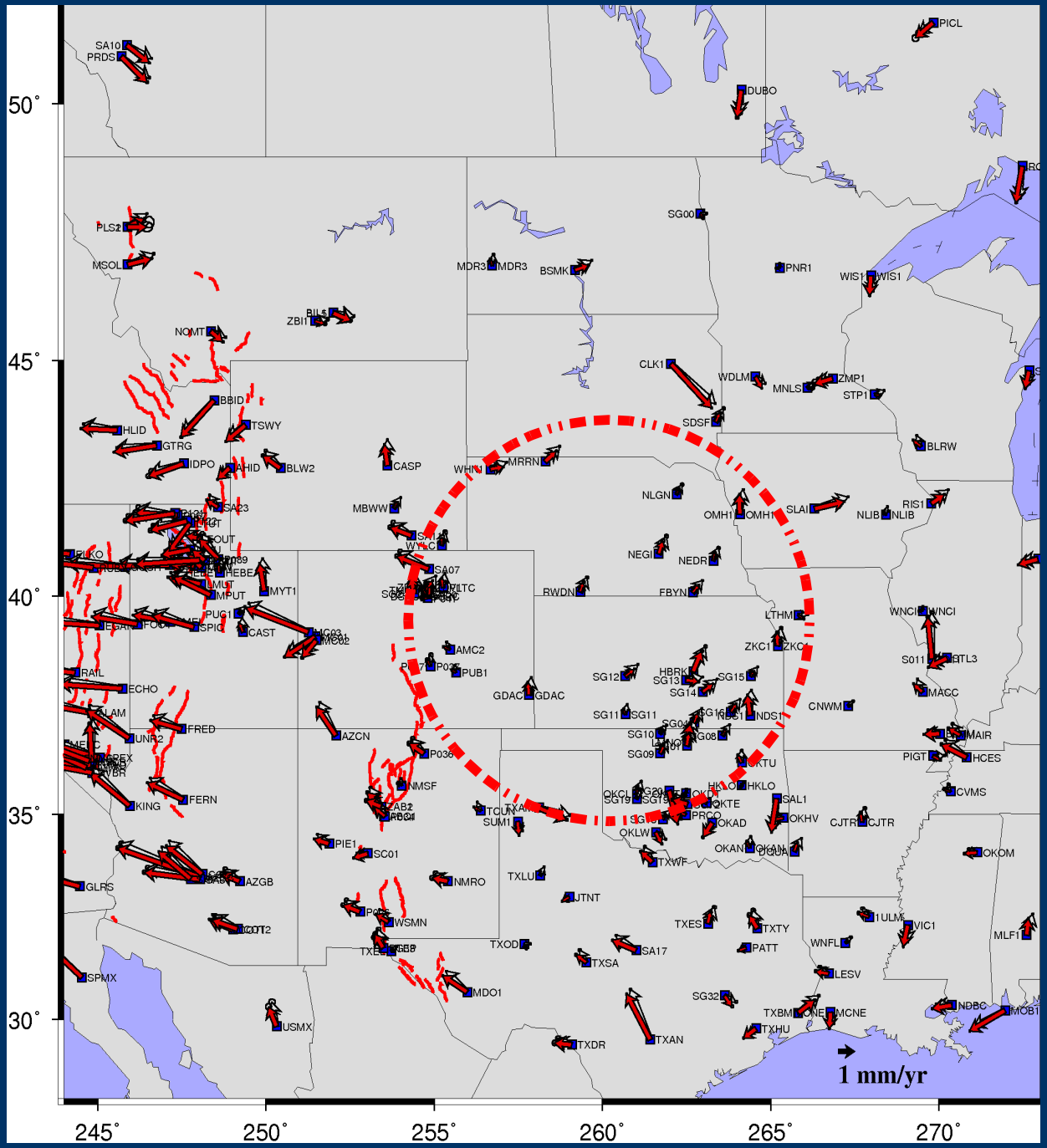
Testing SNARF

Is anomalous motion result of the choice of common sites with SNARF ?

Testing SNARF

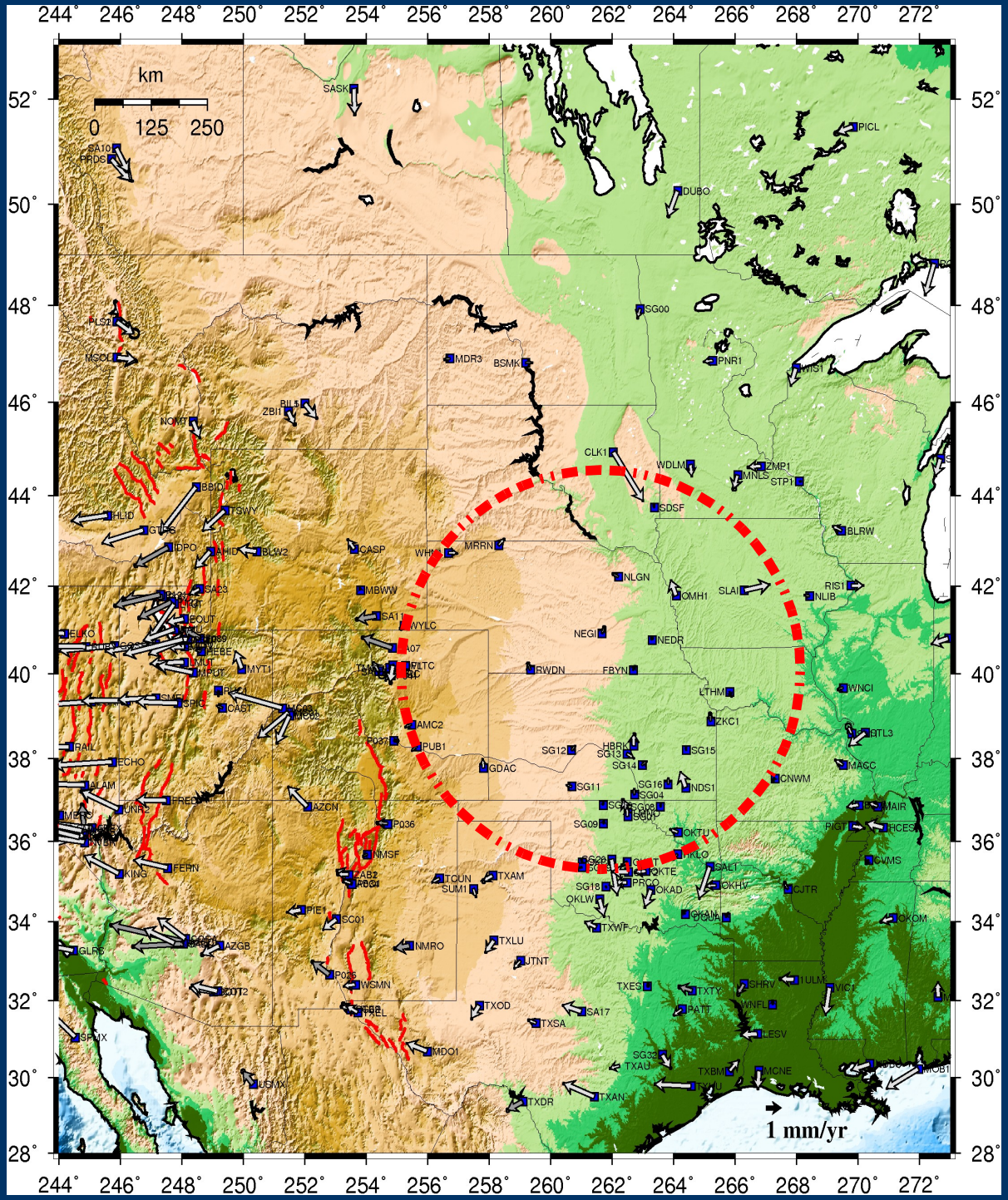


Testing SNARF



Is anomalous motion result of the choice of common sites with SNARF ?

Unexplained anomalous NNE motion of the Great Plains (see also Calais et al., 2006)

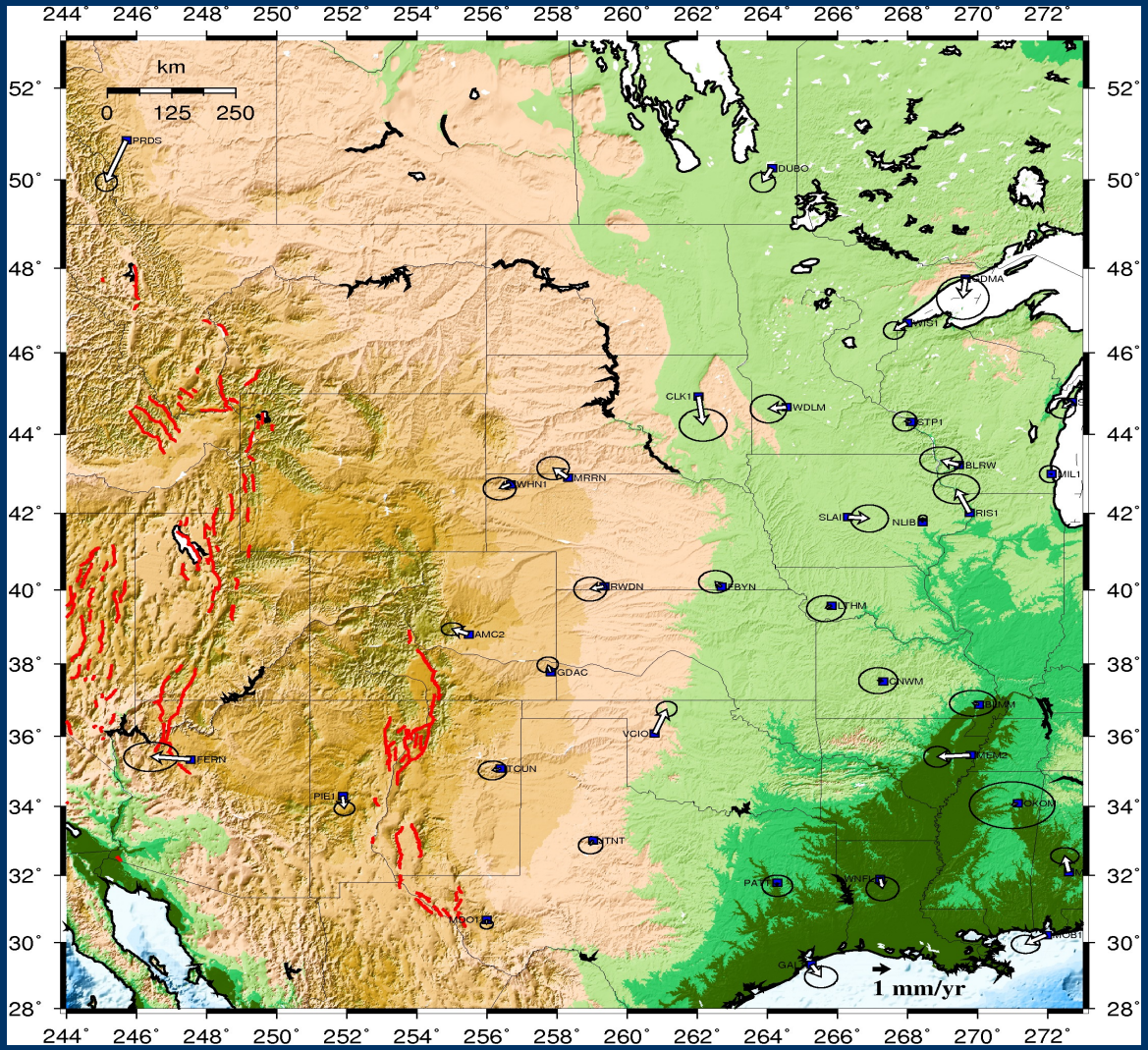


Velocities Relative to UNR-NA

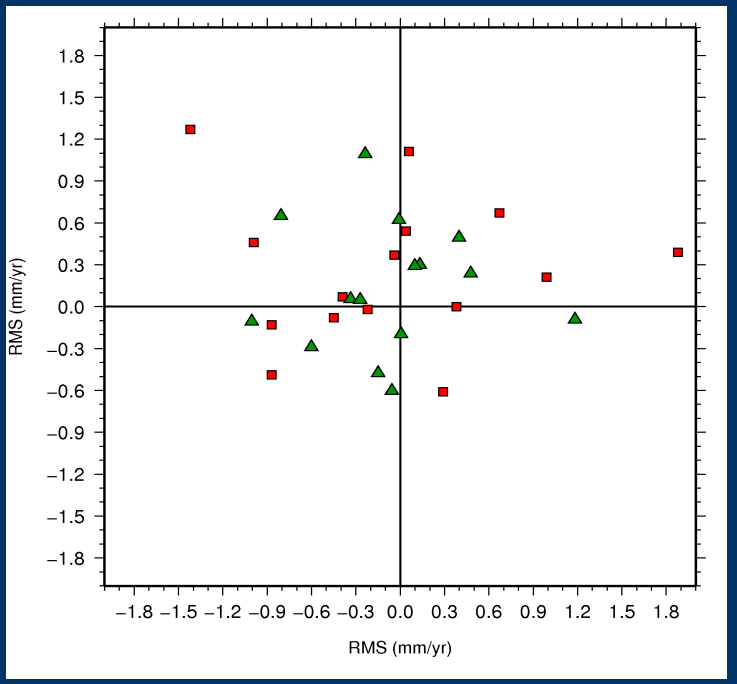
Velocities obtained from position time-series in UNR-NA frame

Great Plains is rigid and moves with North America

Testing SNARF



SNARF velocities themselves seem not to be biased



Velocities Relative to UNR-NA

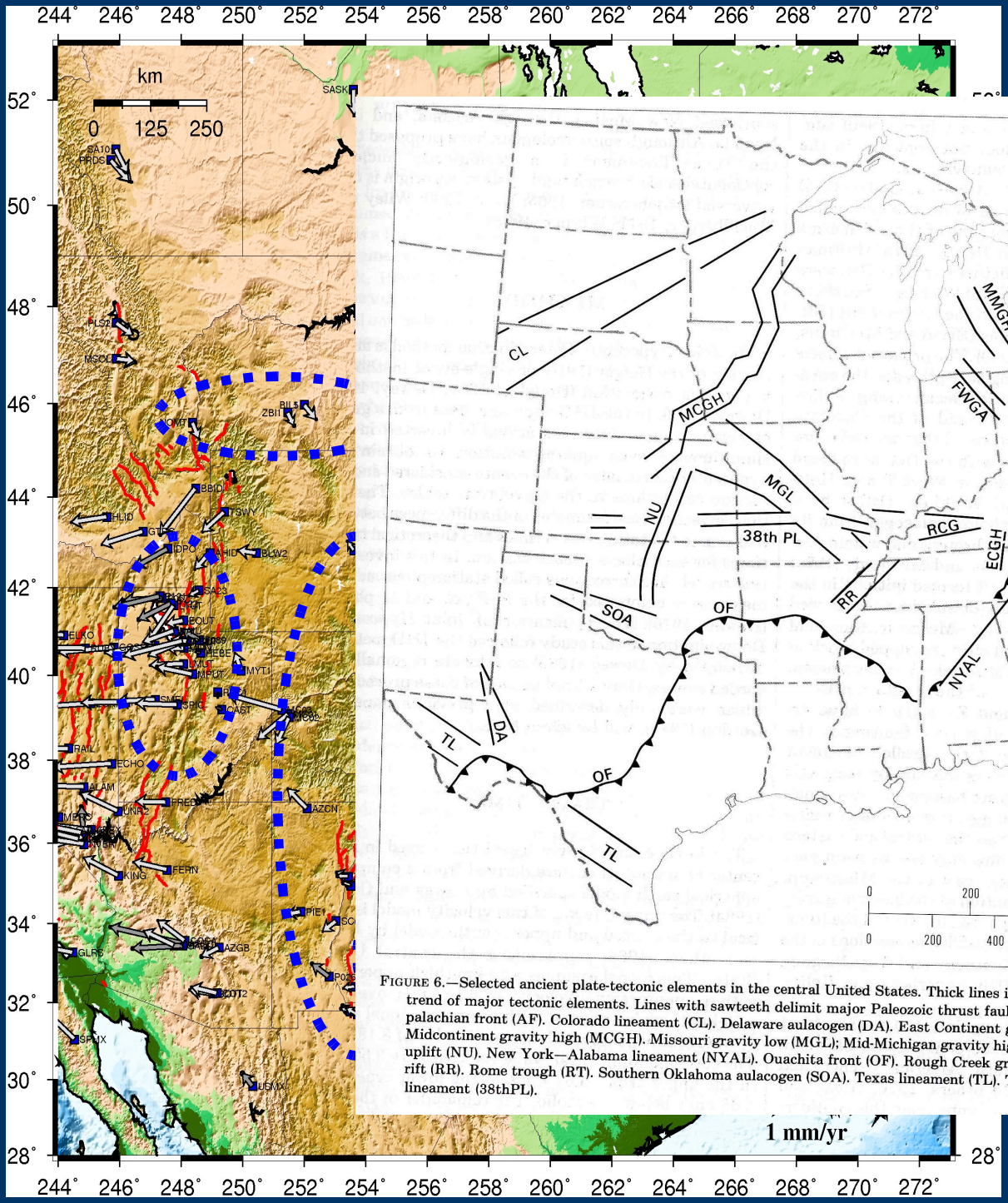


FIGURE 6.—Selected ancient plate-tectonic elements in the central United States. Thick lines indicate the outline or trend of major tectonic elements. Lines with sawteeth delimit major Paleozoic thrust faulting and folding. Appalachian front (AF). Colorado lineament (CL). Delaware aulacogen (DA). East Continent gravity high (ECGH). Midcontinent gravity high (MCGH). Missouri gravity low (MGL); Mid-Michigan gravity high (MMGH). Nemaha uplift (NU). New York—Alabama lineament (NYAL). Ouachita front (OF). Rough Creek graben (RCG). Reelfoot rift (RR). Rome trough (RT). Southern Oklahoma aulacogen (SOA). Texas lineament (TL). Thirty-eighth Parallel lineament (38thPL).

ignal

otion of southern Montana

l extension across Wasatch

notion of western Texas

solved strain accumulation
s Rockies and Rio Grande

rmation across Oklahoma ?

Madrid ?

Conclusions

Last few WG meetings I indicated that one should not use the published SNARF pole, but transform ITRF velocities into SNARF

Now, we have strong evidence that that practice also leads to biased velocities

Recommendation is that the preferred approach, as stated in earlier WG meetings, is to provide to the user daily transformation parameters such that proper SNARF velocities can be obtained

In that case, various interesting (real?) features start to appear in the data