



NZGD2000 – a useful fiction

Chris Crook | Technical Leader Spatial Information

NZGD2000 – a fiction?

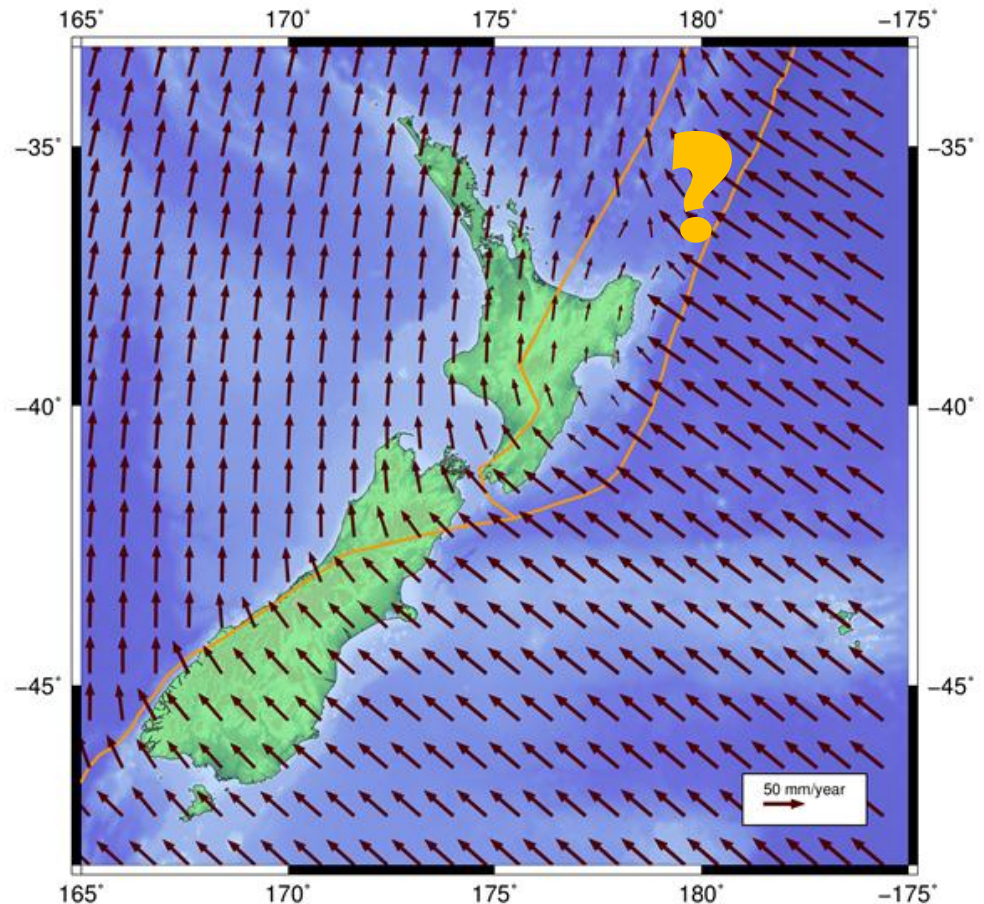
New Zealand ~~Geodetic Datum~~ 2000

Useful ✓

- Review what NZGD2000 is
- Revise terminology
- The challenges

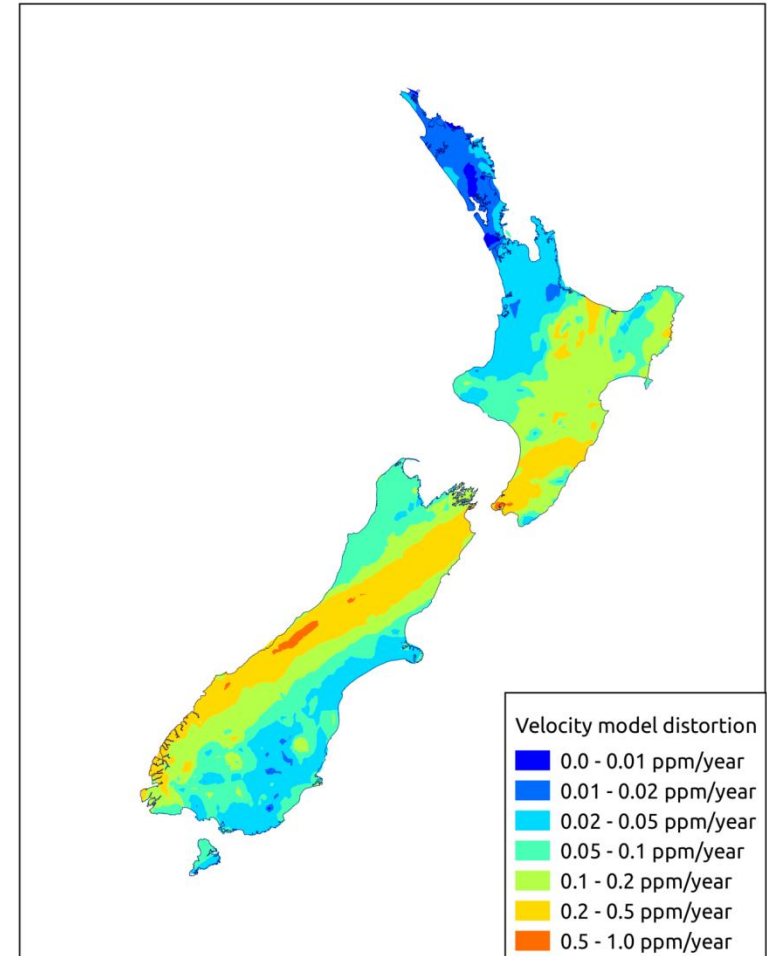
NZGD2000 - definition

- Referenced to ITRF96
- Coordinates originally aligned with ITRF96 on 1 Jan 2000
- Deformation model relates NZGD2000 coordinates to ITRF96 at other times
- ITRF96 not accessible now – use transformation from ITRF2008



NZGD2000 - distortion

- Distortion introduces error of up to 1 cm in 1km (in 2014)
- For many applications can be practically ignored
- Not a datum?
- Is useful!



NZGD2000 - patches

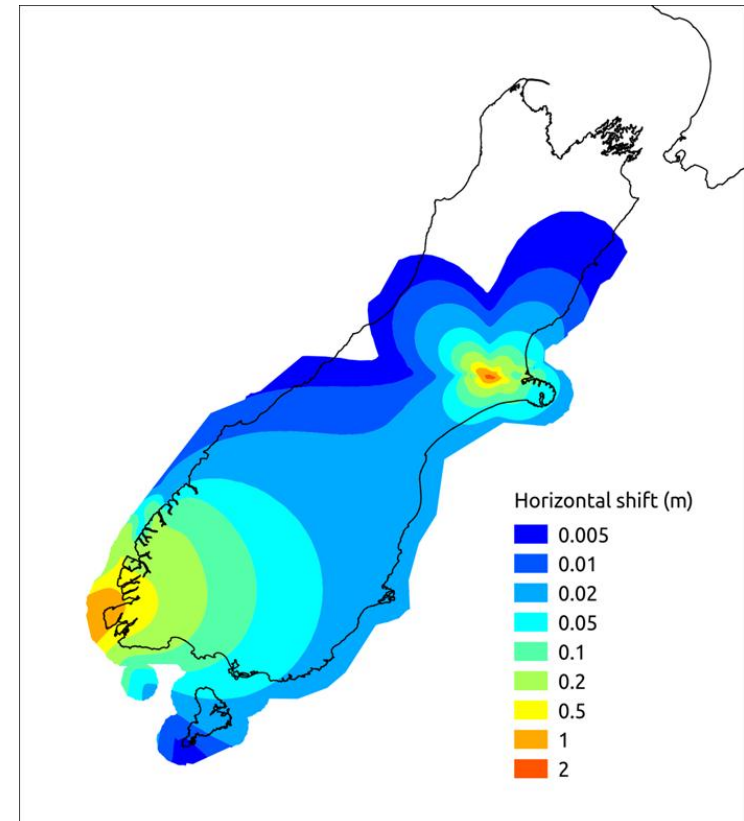
“Patches” add deformation due to earthquakes to the deformation model

“Reverse patches” – deformation is applied to NZGD2000 coordinates – subtract patch for dates before earthquake

Each update of deformation model is new version of datum

NZGD2000 is not 2000!

NZGD2000 is a series of datums



Rescind: Semi-dynamic datum

Replace with:

“Plates-fixed” datum

Rescind: Coordinates at epoch 2000

Replace with:

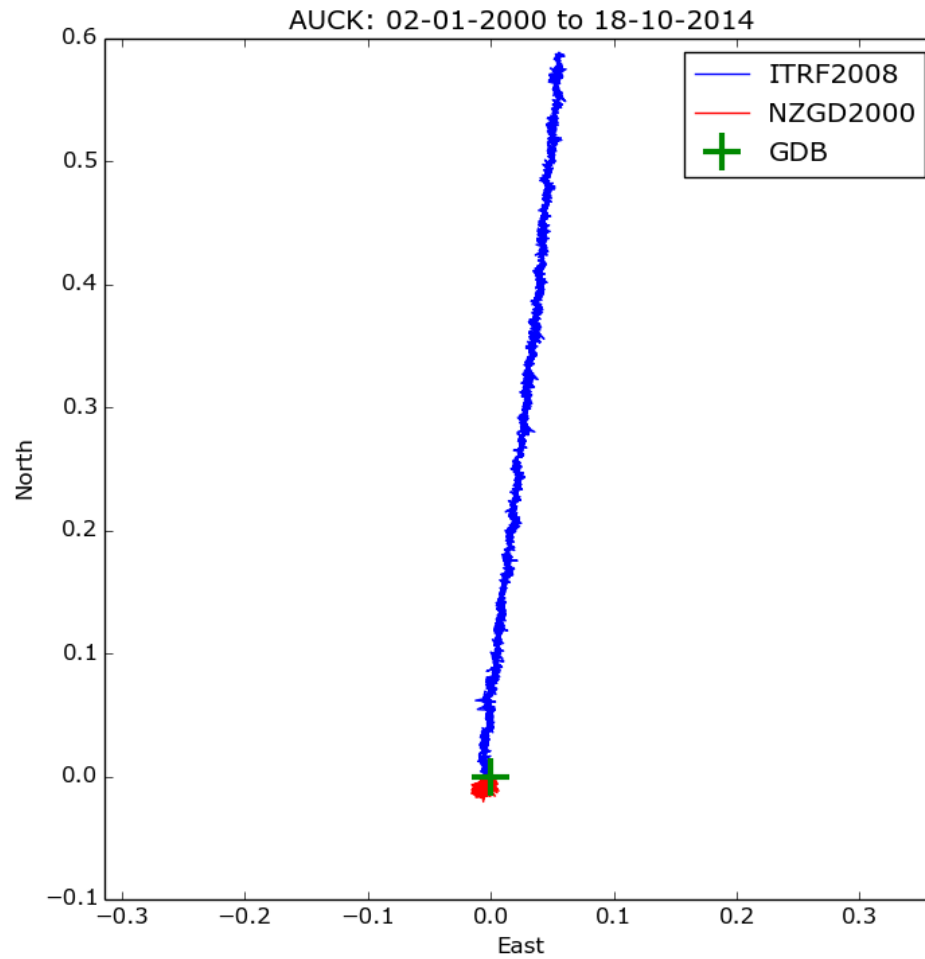
Nothing! NZGD2000 coordinates are defined at the time of observation.

Rescind: "propagate coordinates back to 2000.0"

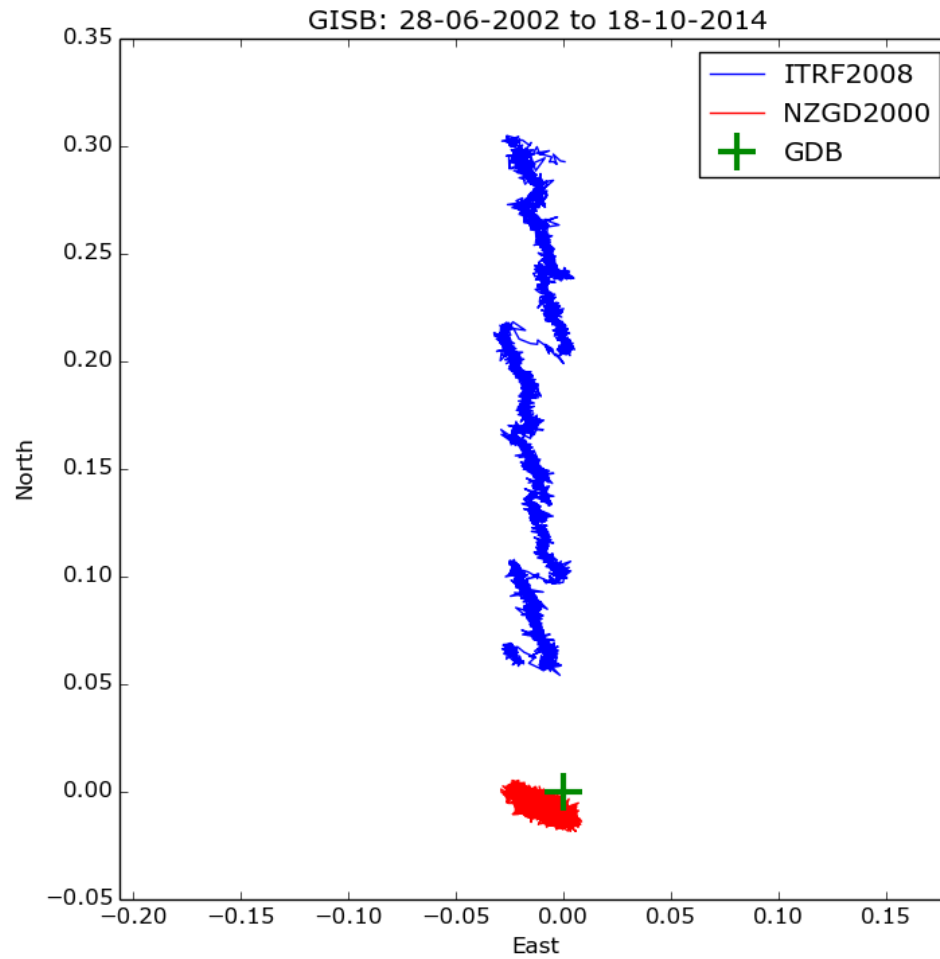
Replace with: "**transform coordinate to NZGD2000**"



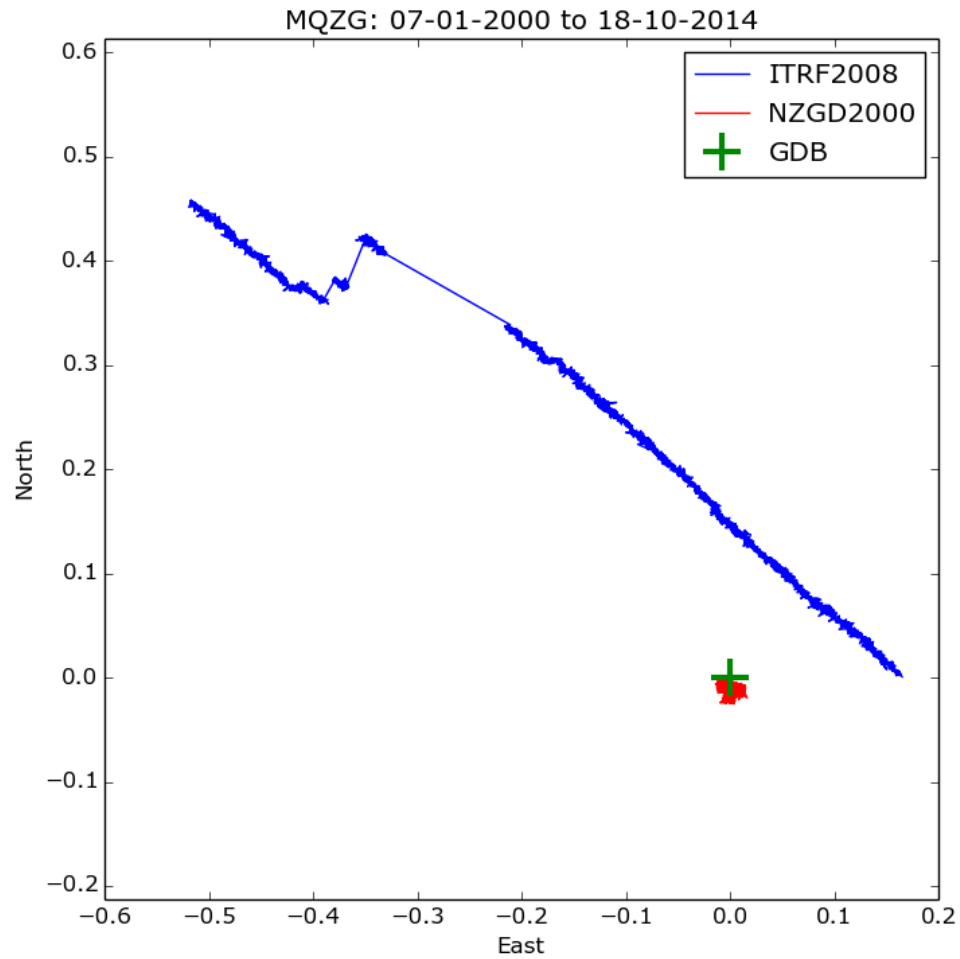
Trajectories



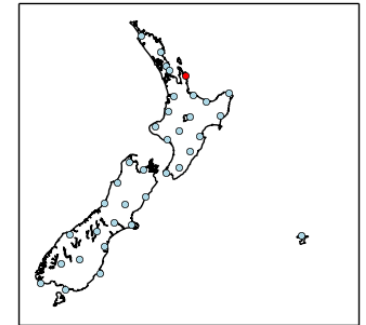
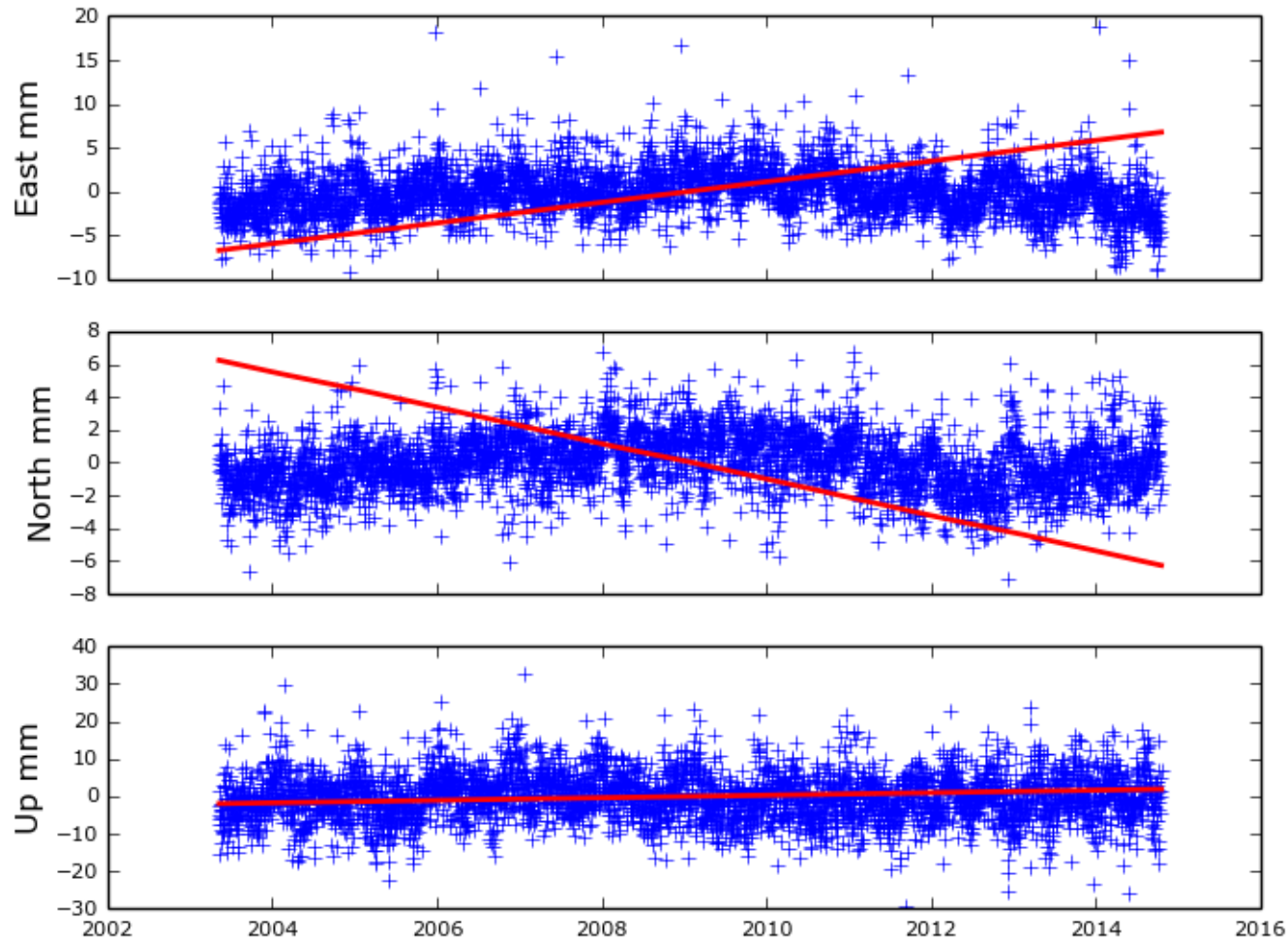
Trajectories



Trajectories

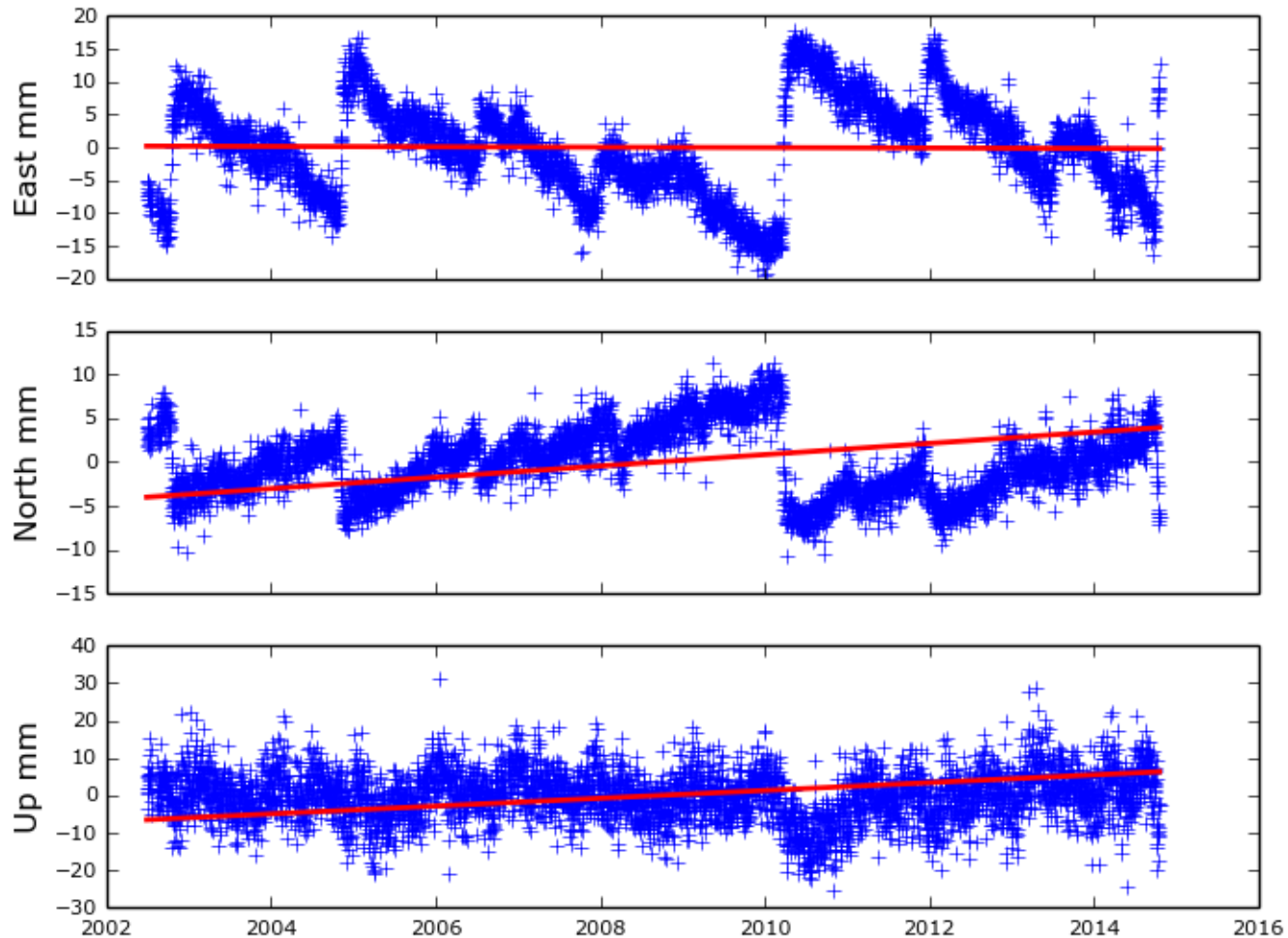


Challenge: Updating the national velocity model

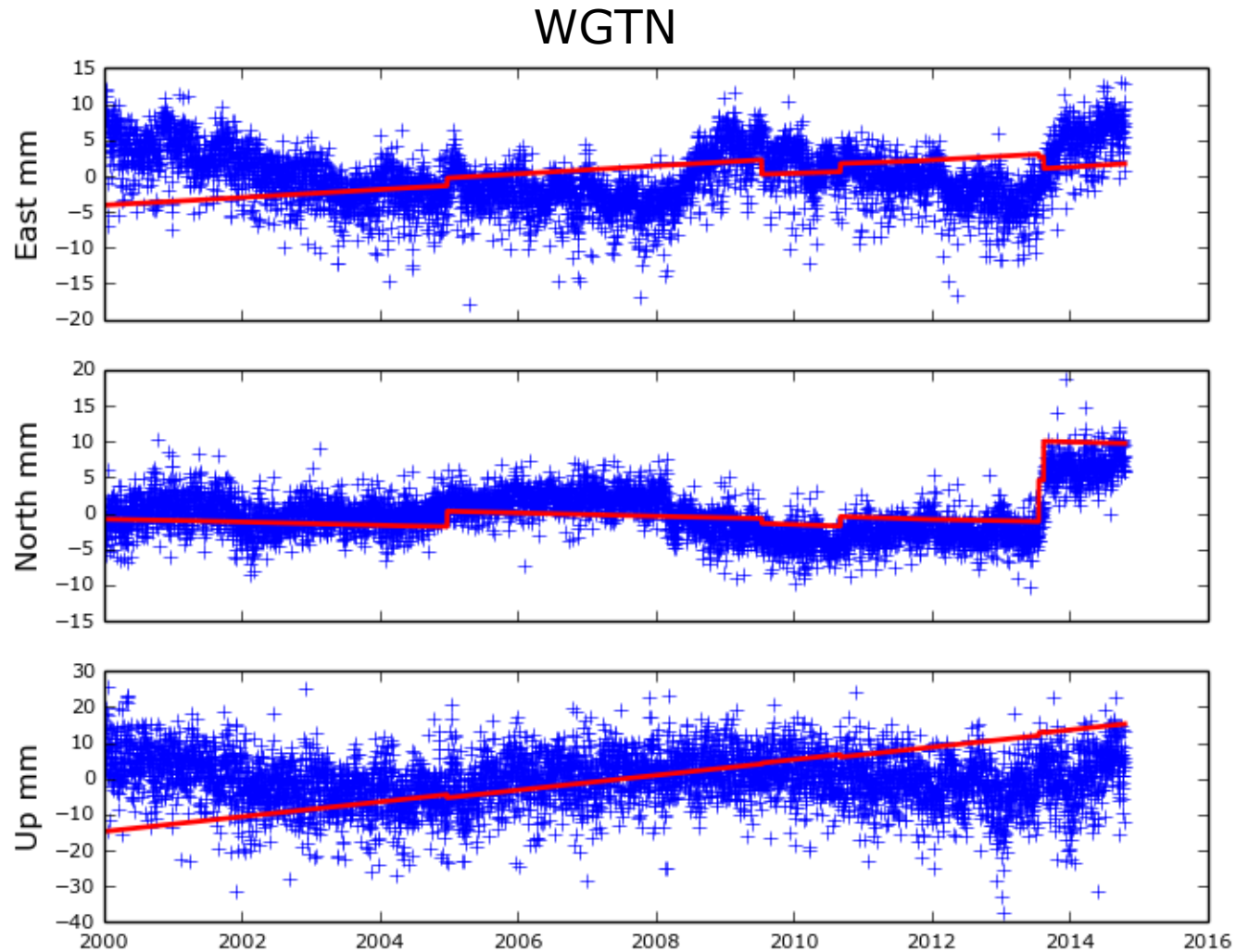


Challenge: Slow slip events

GISB



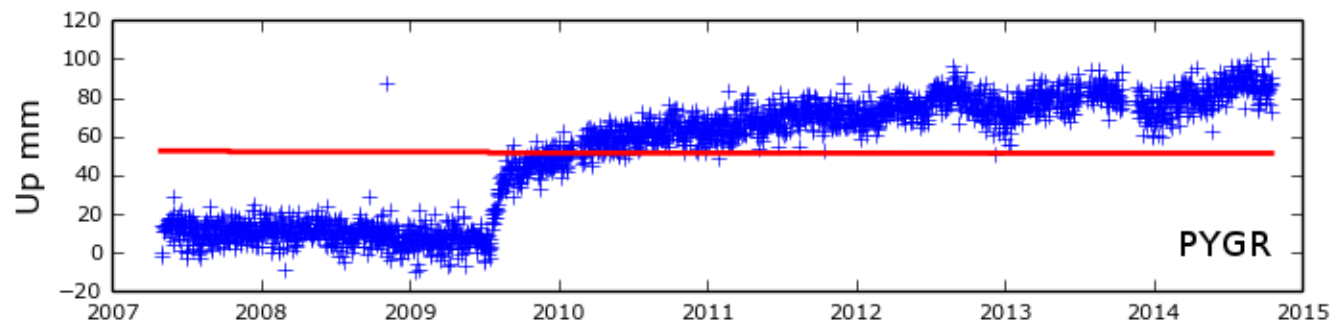
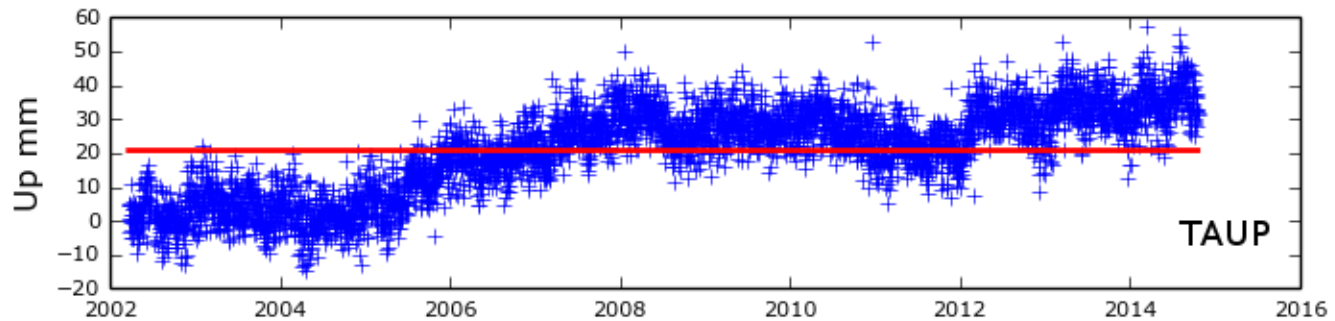
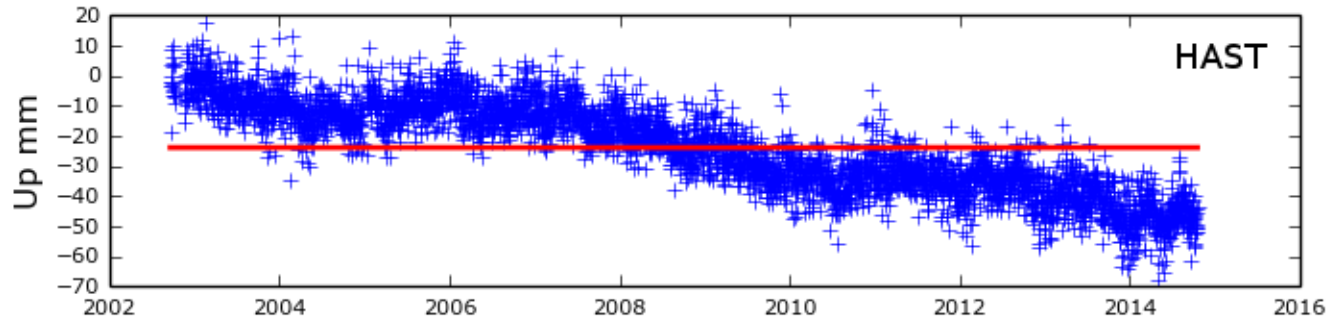
Challenge: Slow slip events



Challenge: Connecting to ITRF

- Practically datum often accessed via PositionNZ station coordinates
- Regional bias in ITRF, discrepancy in coordinates of a few cm depending on what is used to constrain solution
- ITRF2013 may improve?

Challenge: Vertical deformation



Conclusion

- NZGD2000 is working for the spatial community
- We are dependent on our connection to the global geodetic infrastructure
- The challenge for the future is maintaining the deformation model

Questions?

