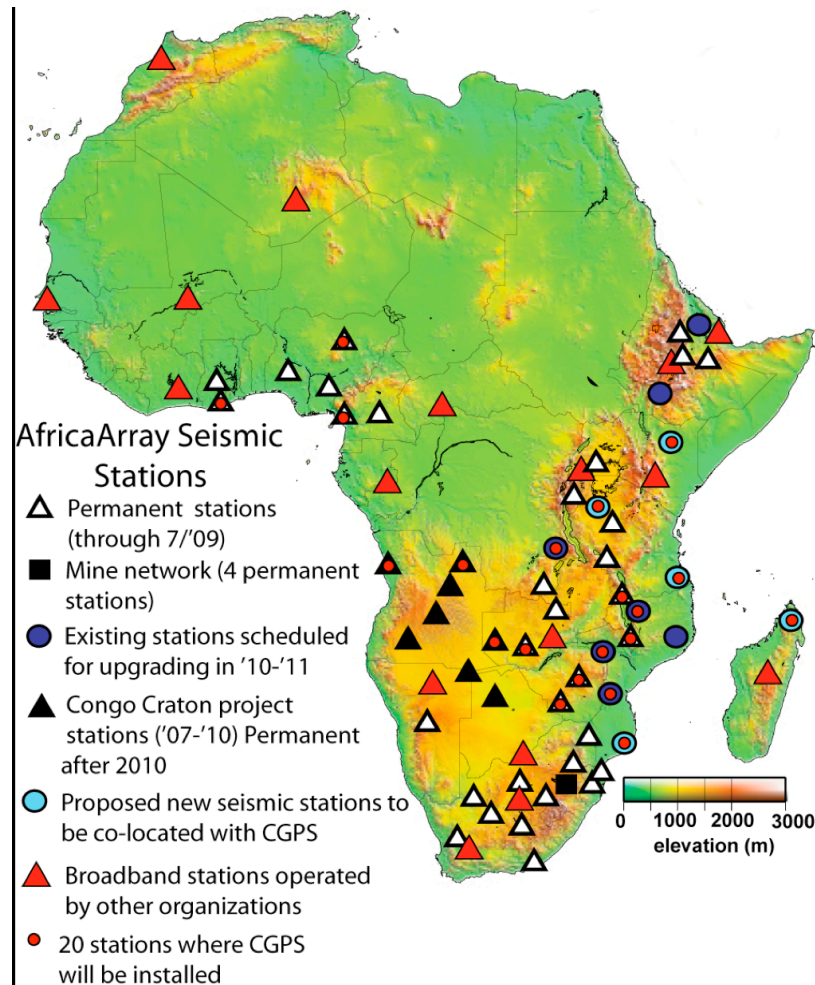
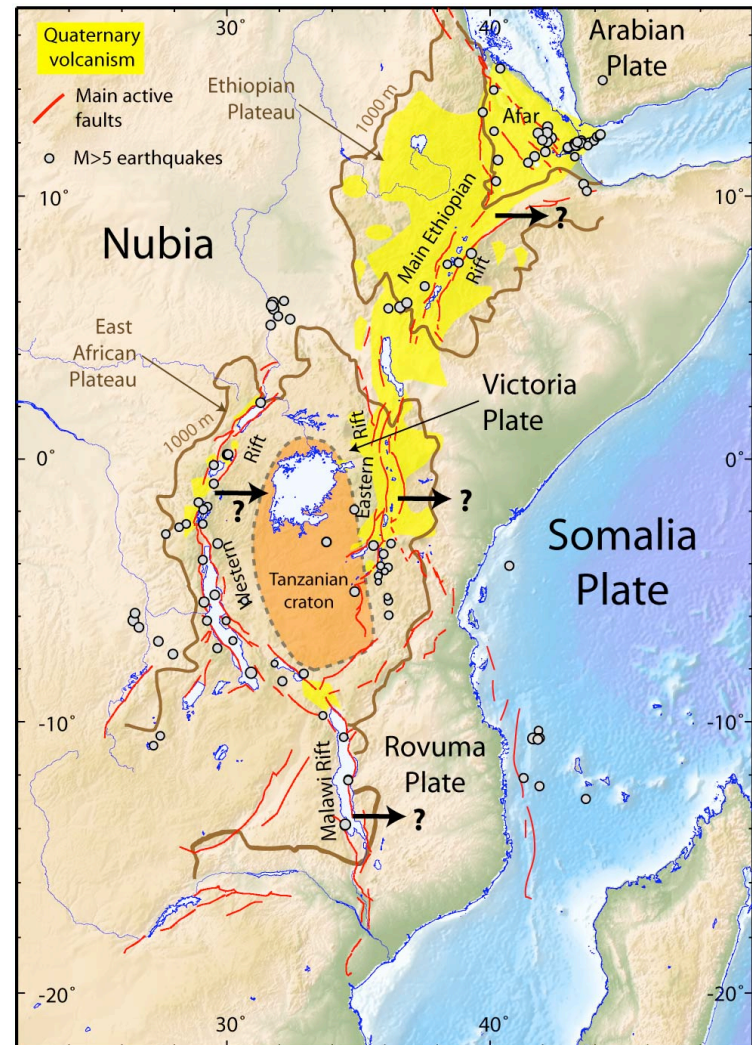
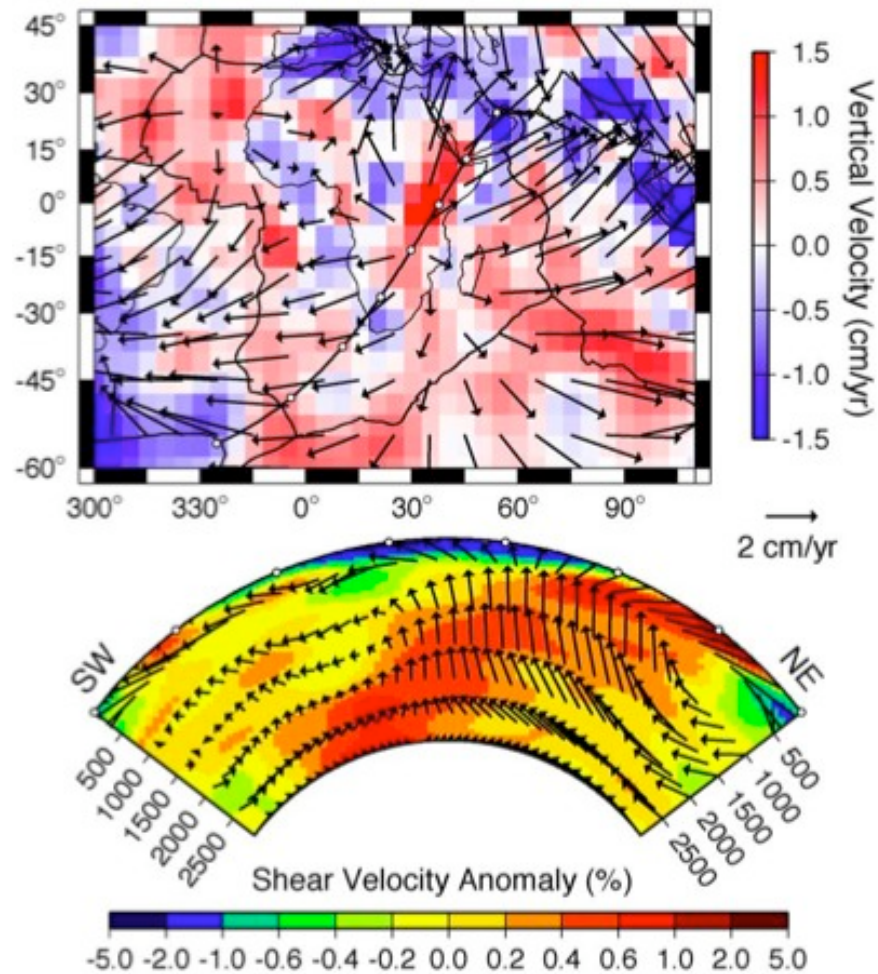


# Summary

- AfricaARRAY = 4-year-old initiative to promote coupled training and research programs for building and maintaining a geoscientific workforce for Africa – PI Andy Nyblade (Penn State)
- UNAVCO and AfricaArray are partnering to create a multidisciplinary research network for the boarder Earth science community by expanding of the AfricaArray seismic network with continuous GPS instruments fitted with meteorological sensors.
- Scientific objectives: plate boundary tectonics and the rifting cycle, the hydrological cycle and climate change in Africa.



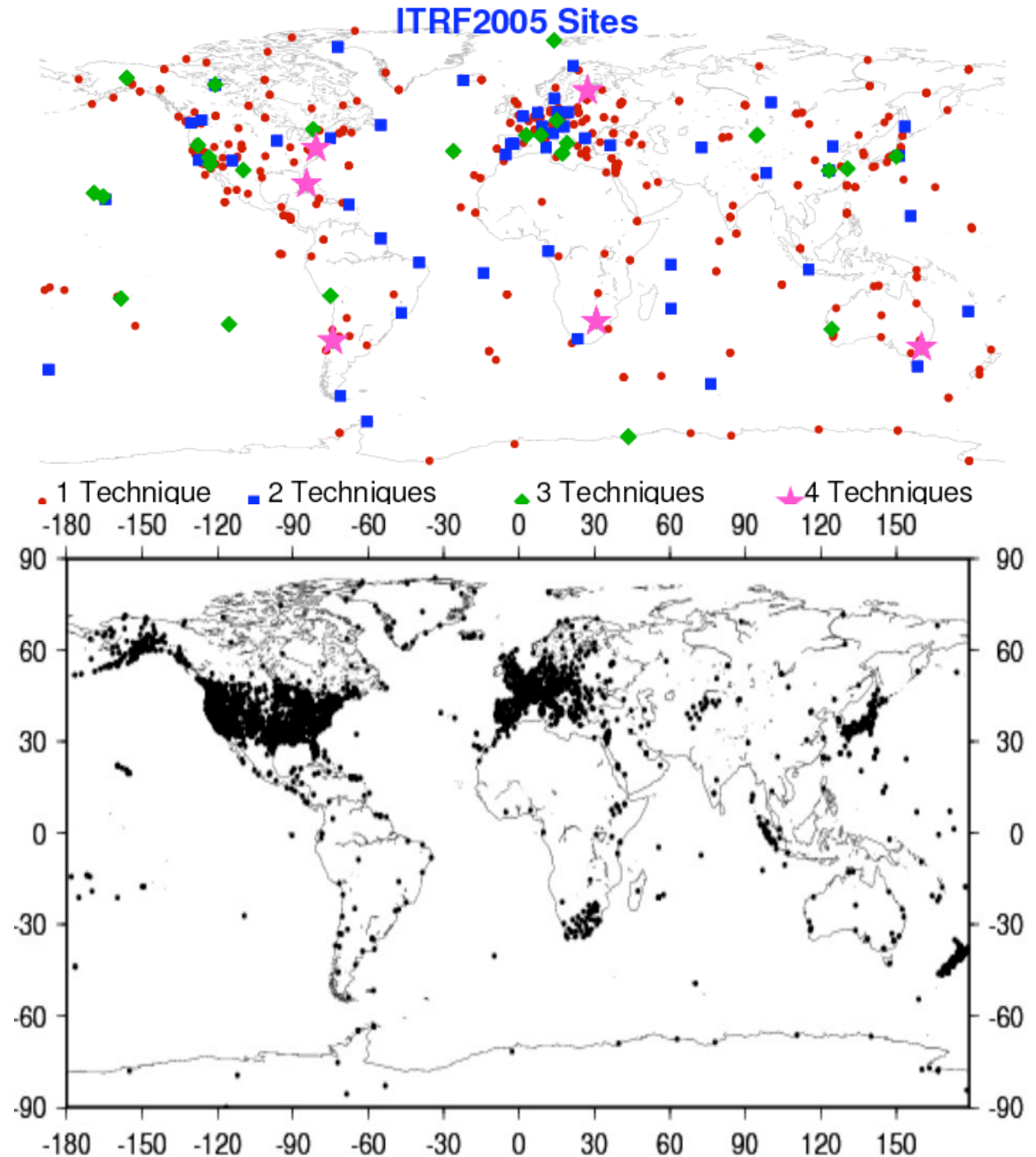
# Solid Earth geophysics



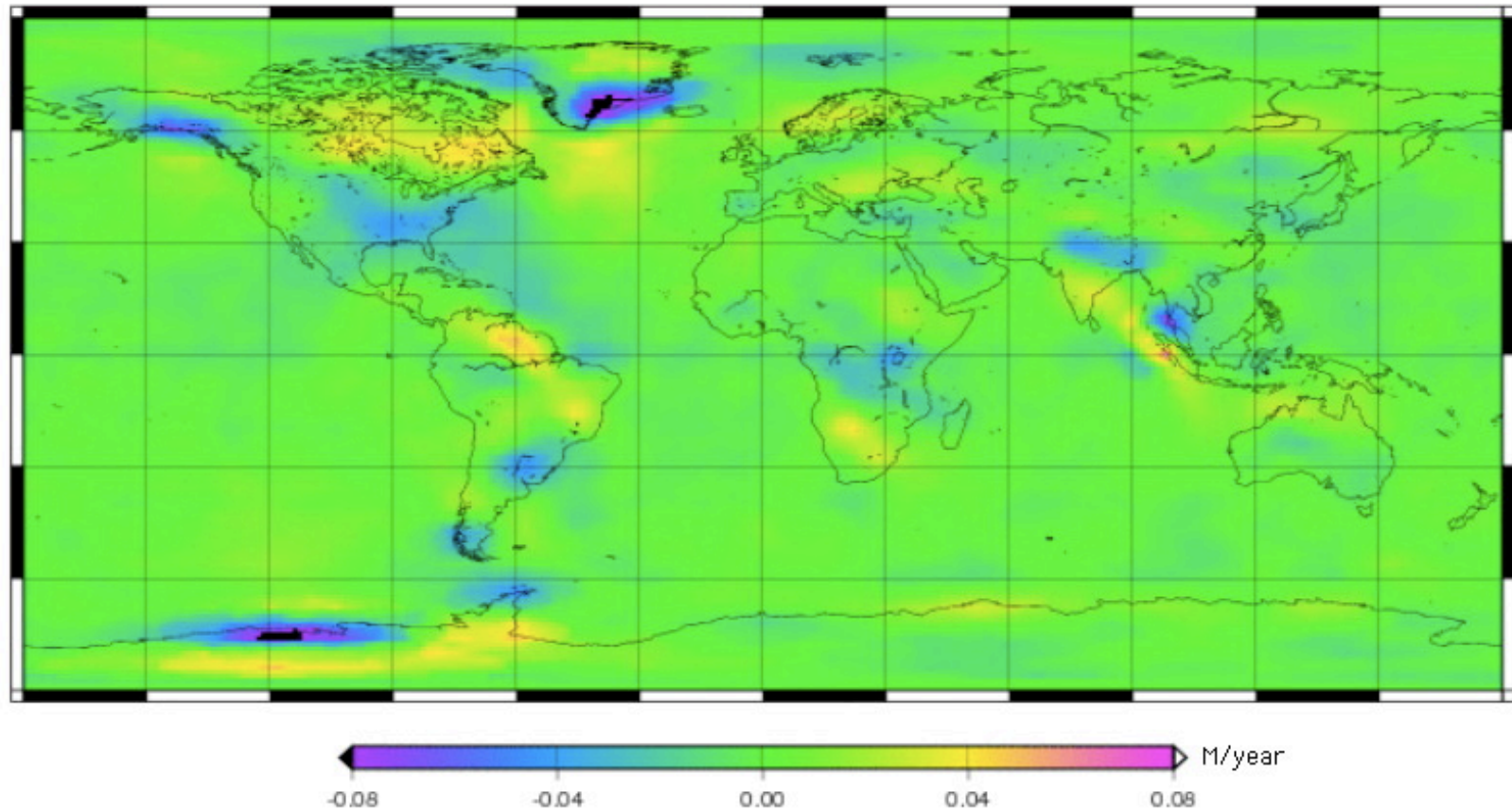
Behn et al., 2004; Ritsema et al., 1999

# Global geodesy, reference frame

Publicly available GPS  
data, courtesy G.  
Blewitt, H.P. Plag (Univ.  
Nevada, Reno)

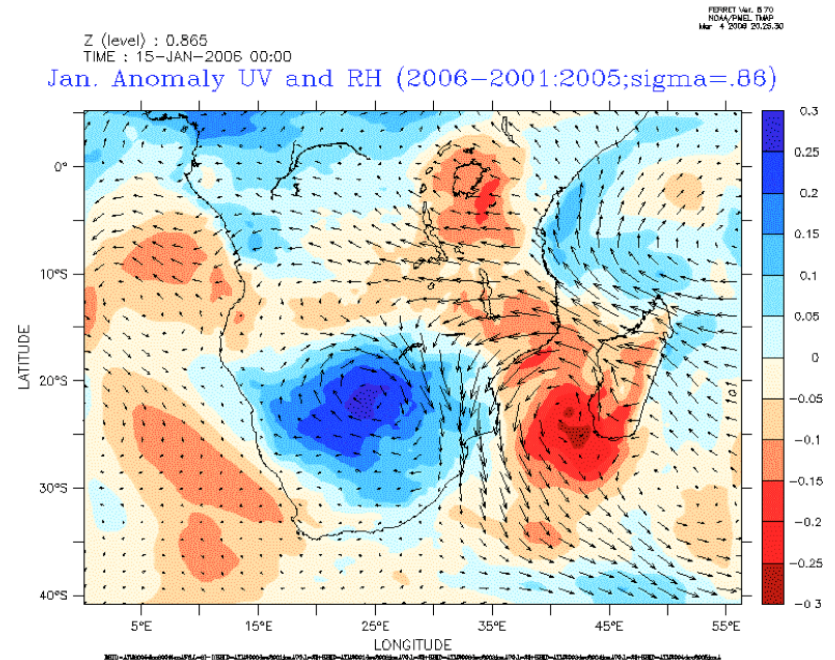


# Hydrology



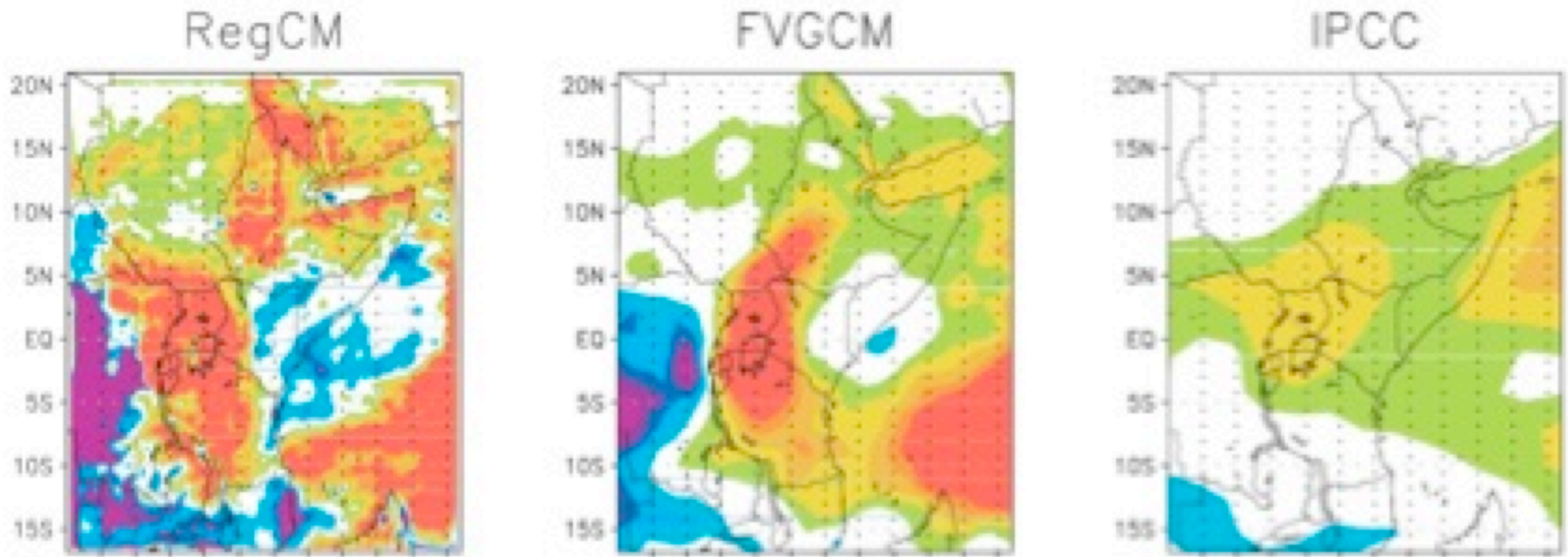
Secular changes in water storage from GRACE data in meters per year (Watkins, 2008). Note the areas of significant changes in Africa, in regions that are poorly sampled by GPS stations. In particular, Lake Victoria water level declines have been identified and partly attributed to climate change.

# Atmospheric water vapor



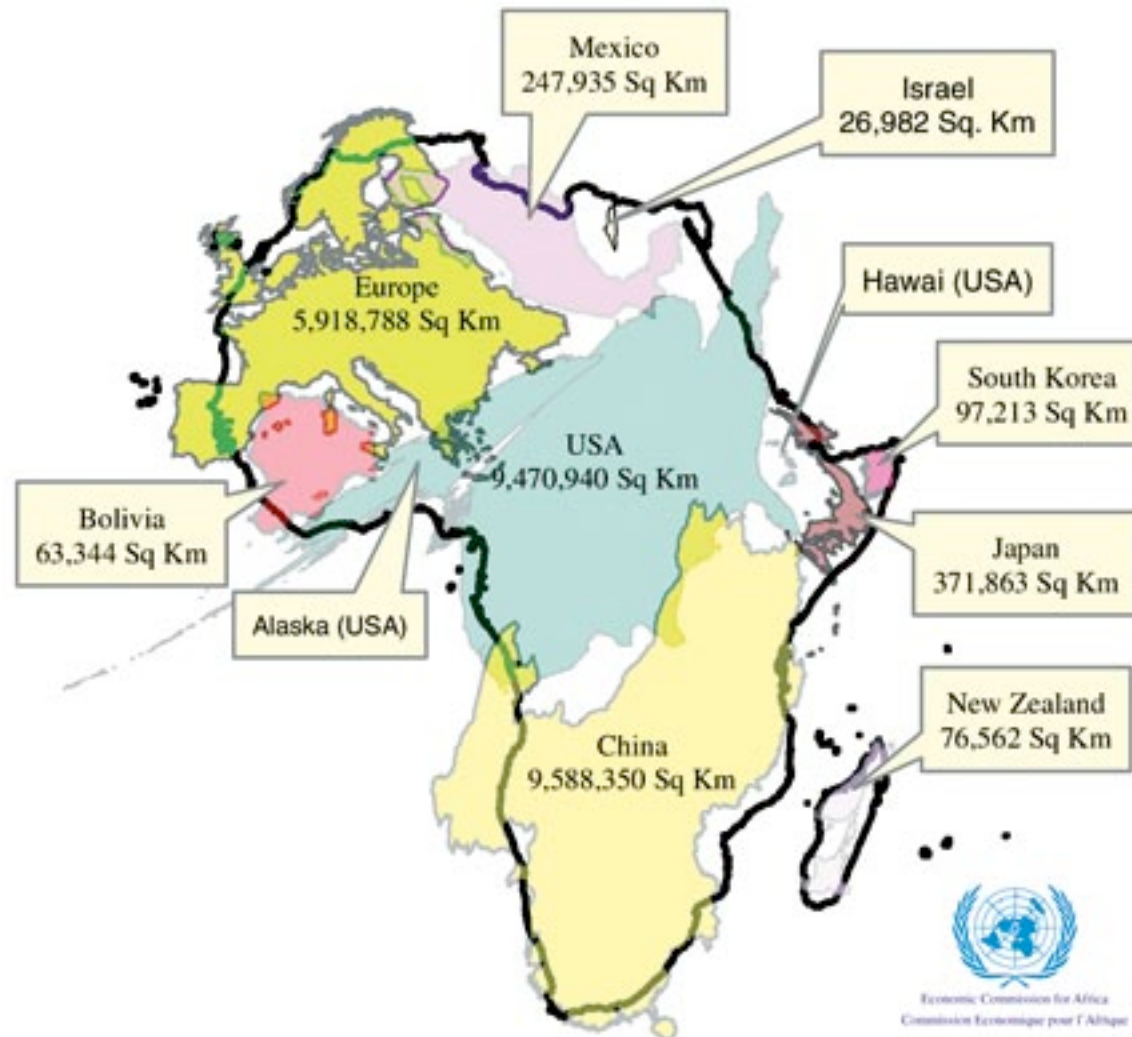
Left: annihilated wildlife in Tanzania during the 2005 record drought. Right: Prediction of drought conditions based on vertically integrated relative humidity. Although the model results appear to be qualitatively realistic, one cannot confirm the model results because the upper air coverage is too sparse over the region.

# Atmospheric water vapor

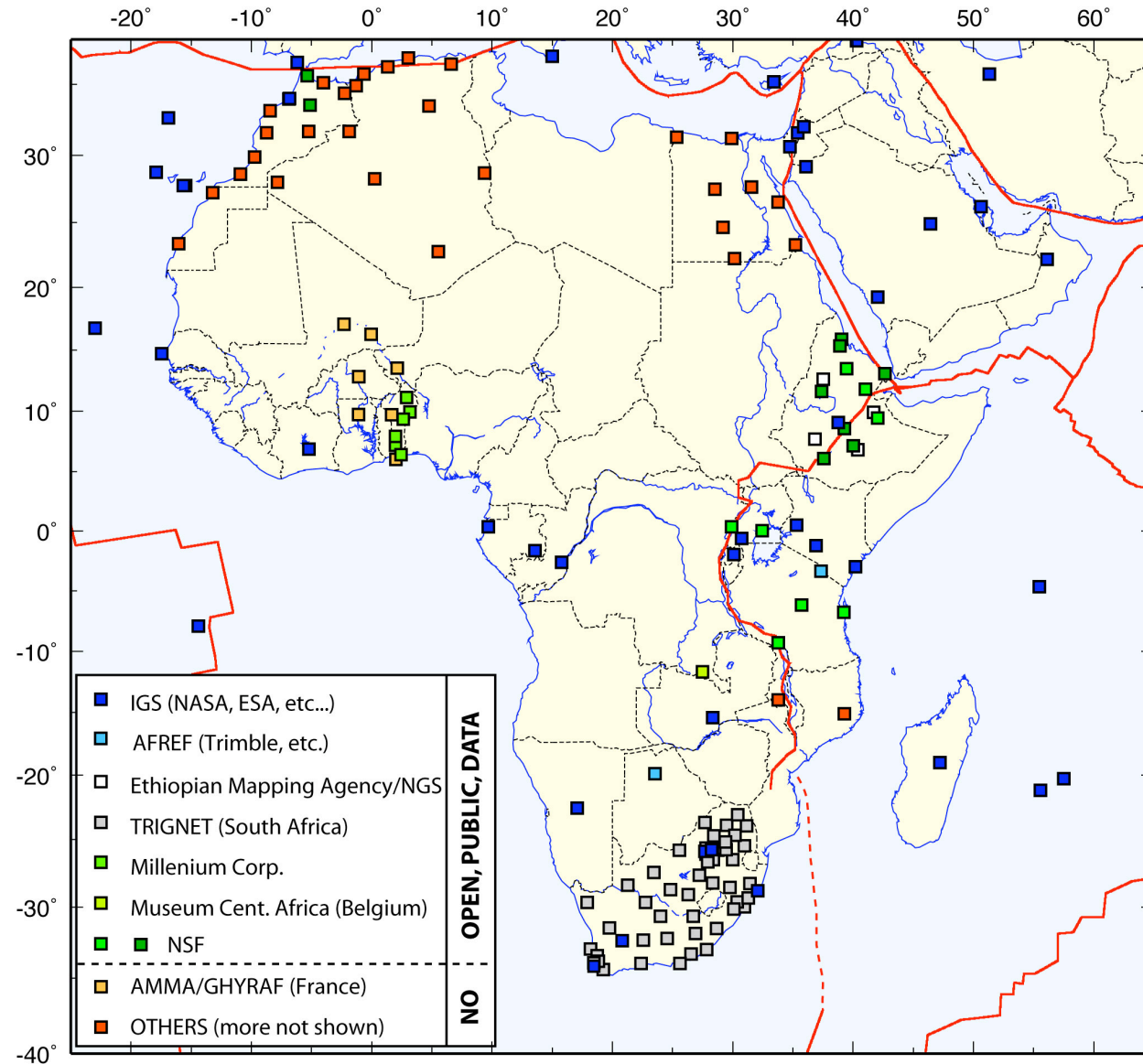


Left: Rainfall projections in east Africa (A2: 2071-2100 average) minus (RF: 1961-1990 average) for the Oct-Dec short rains. Middle: RegCM3 (40 km grid) 2-member FvGCM ensemble average. Right: eight IPCC GCM super ensemble averages. Units are in mm (Semazzi et al. 2009, personal communication). The largest signal in the interior of east Africa is located over the Lake Victoria Basin for all 3 simulations.

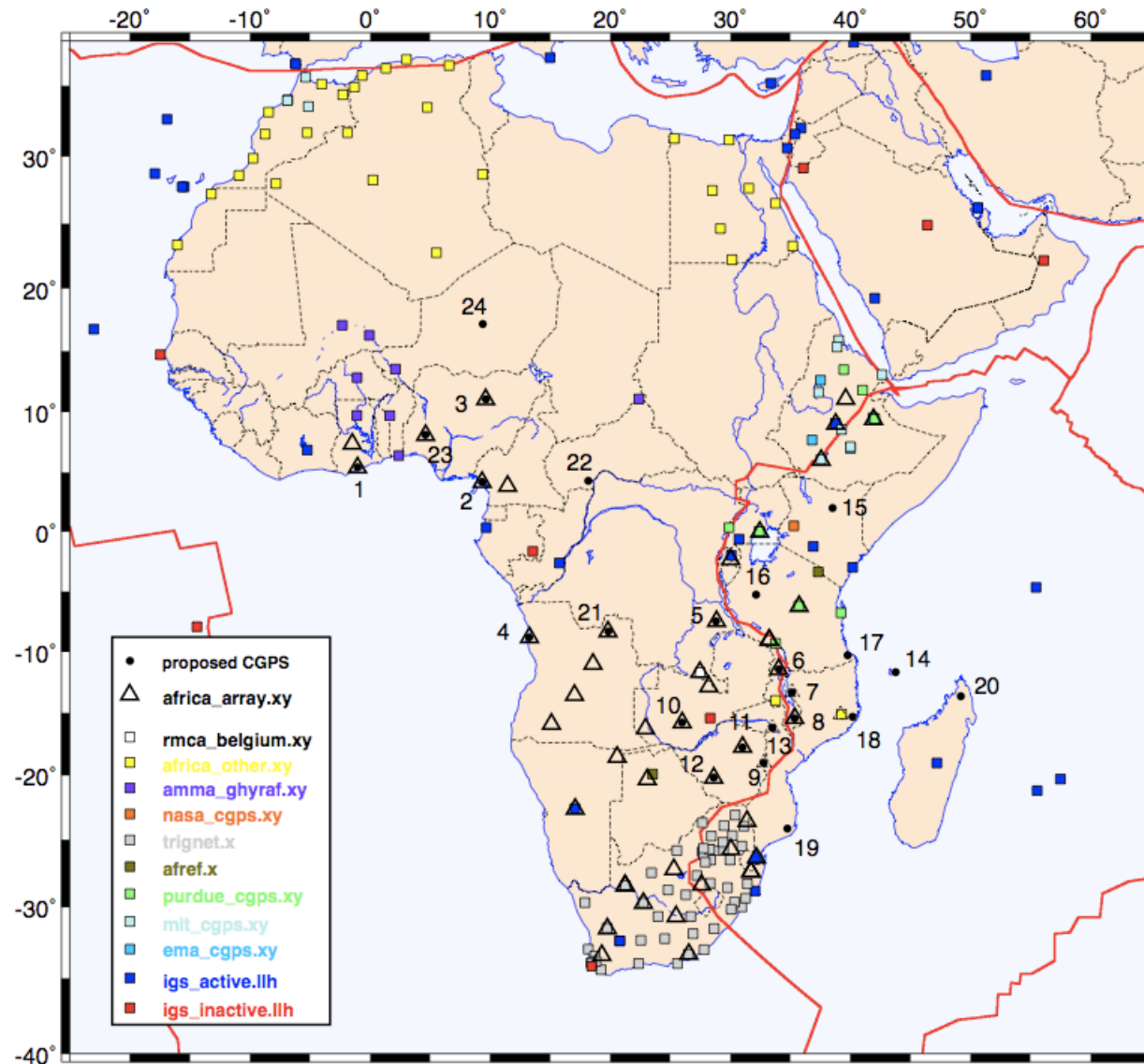
Europe + USA + Japan+ China +... =  
8,000+ continuous GPS



# Current cGPS status in Africa



# Proposed cGPS deployment



# Next steps

- Proposal currently under review (NSF/MRI)
- Funding requested for a 3-day workshop:
  - Bring together U.S. scientists + their African collaborators to examine and codify the scientific rationale for expanding the AfricaArray seismic network into a multidisciplinary science network.
  - Benefits of a single instrumentation initiative that addresses the science needs of several geoscience disciplines, including atmospheric science (including climate), geodesy, geography, hydrology, seismology, and space weather.
  - March 31 to April 2, 2010 at Howard University in Washington D.C.