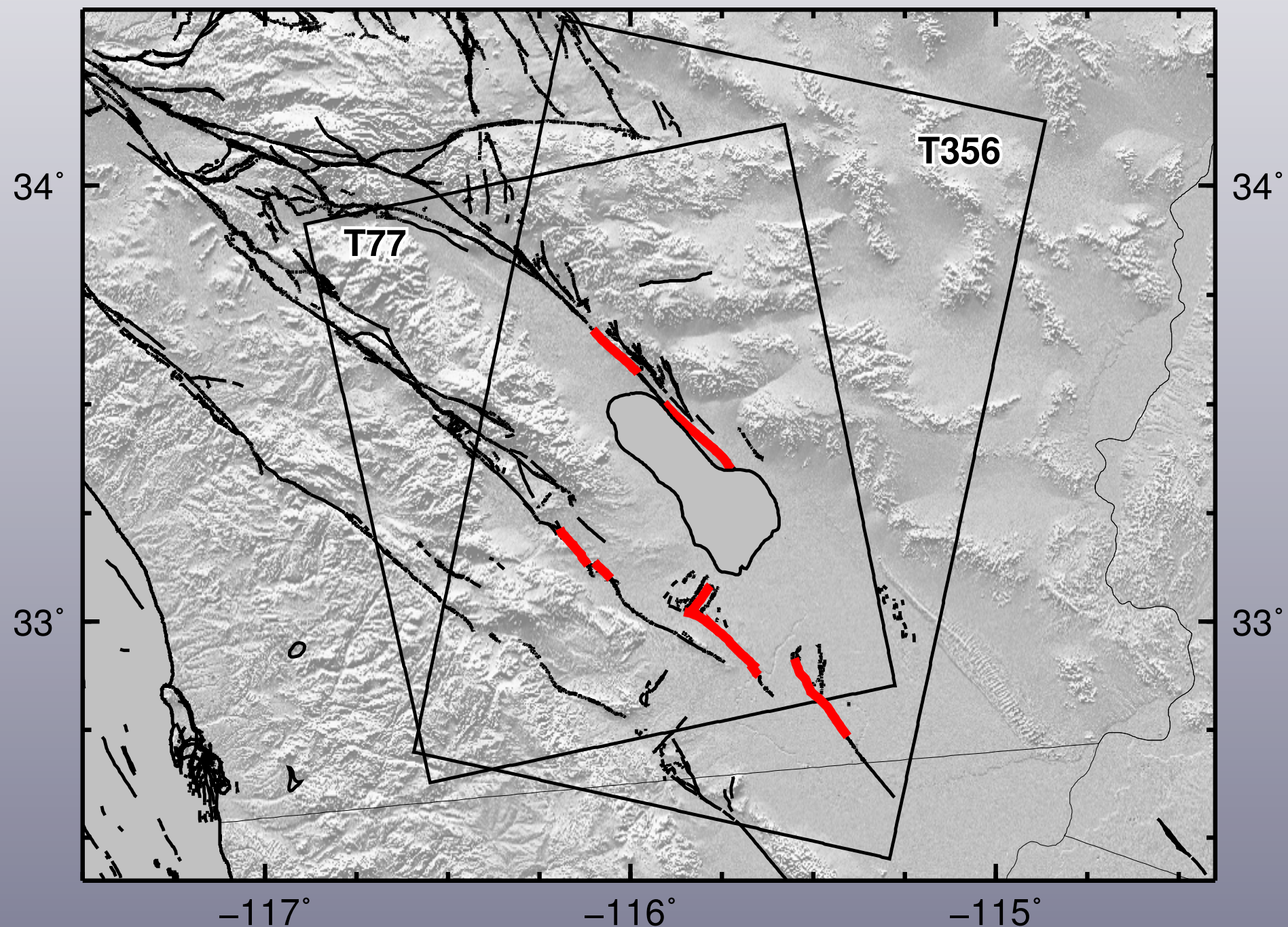


Fault creep: GPS and InSAR opportunities



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Envisat 2003-2010

- T356 + T77 processed in ROIPAC and GMTSAR (> 150 i'grams/track)
- Compute RMS noise for each date, stack best pairs (~30 i'grams/track)
- Assume a combination of fault-parallel and vertical motion only:

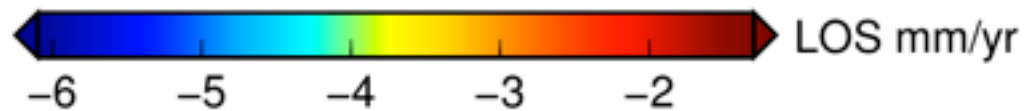
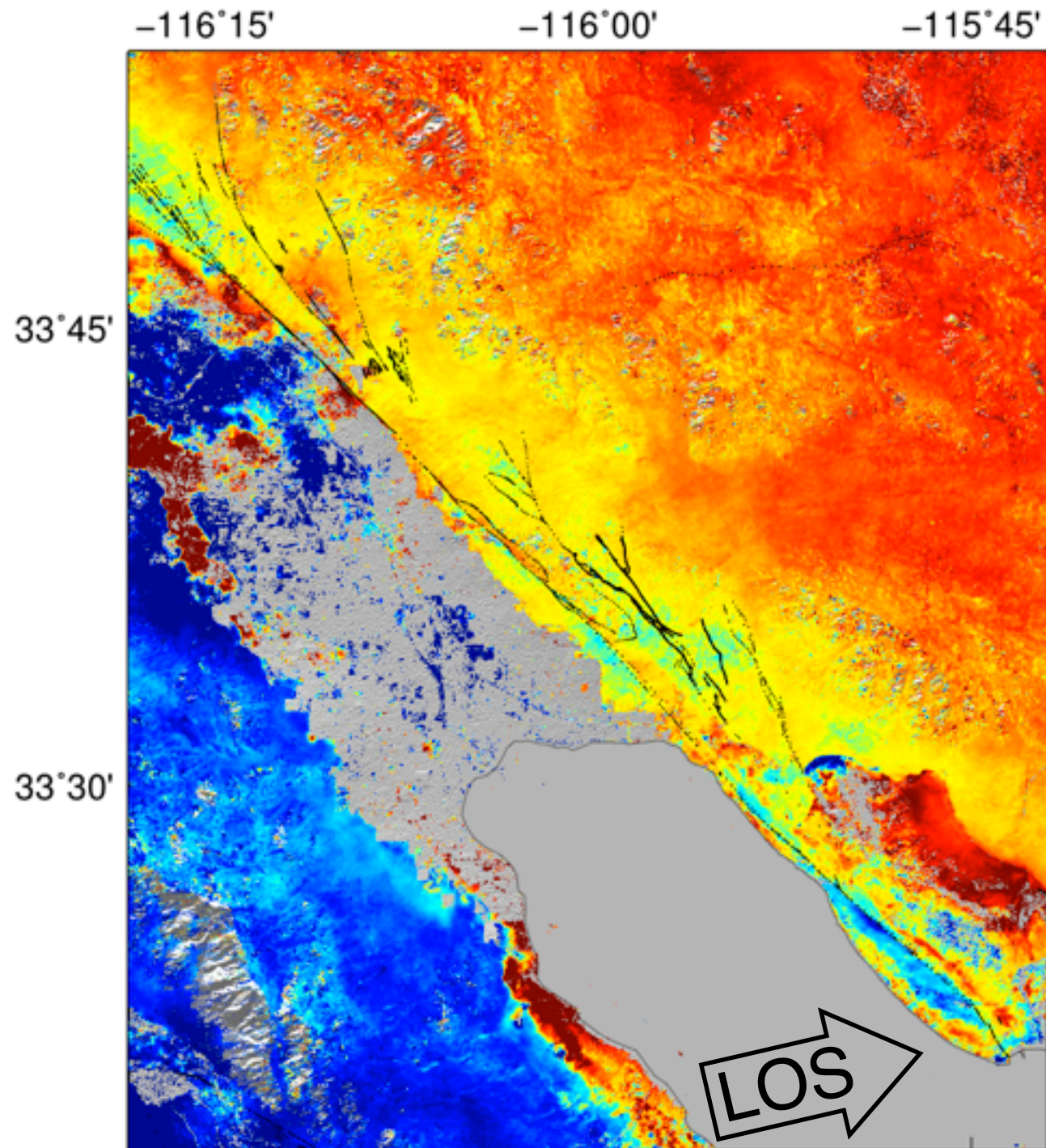
$$\begin{pmatrix} v_1 \\ v_2 \end{pmatrix} = \mathbb{P} \begin{pmatrix} v_f \\ v_z \end{pmatrix}, \quad \mathbb{P} = \begin{pmatrix} e_1 \sin \alpha + n_1 \cos \alpha & u_1 \\ e_2 \sin \alpha + n_2 \cos \alpha & u_2 \end{pmatrix}$$

$$\begin{pmatrix} v_f \\ v_z \end{pmatrix} = \mathbb{P}^{-1} \begin{pmatrix} v_1 \\ v_2 \end{pmatrix}$$

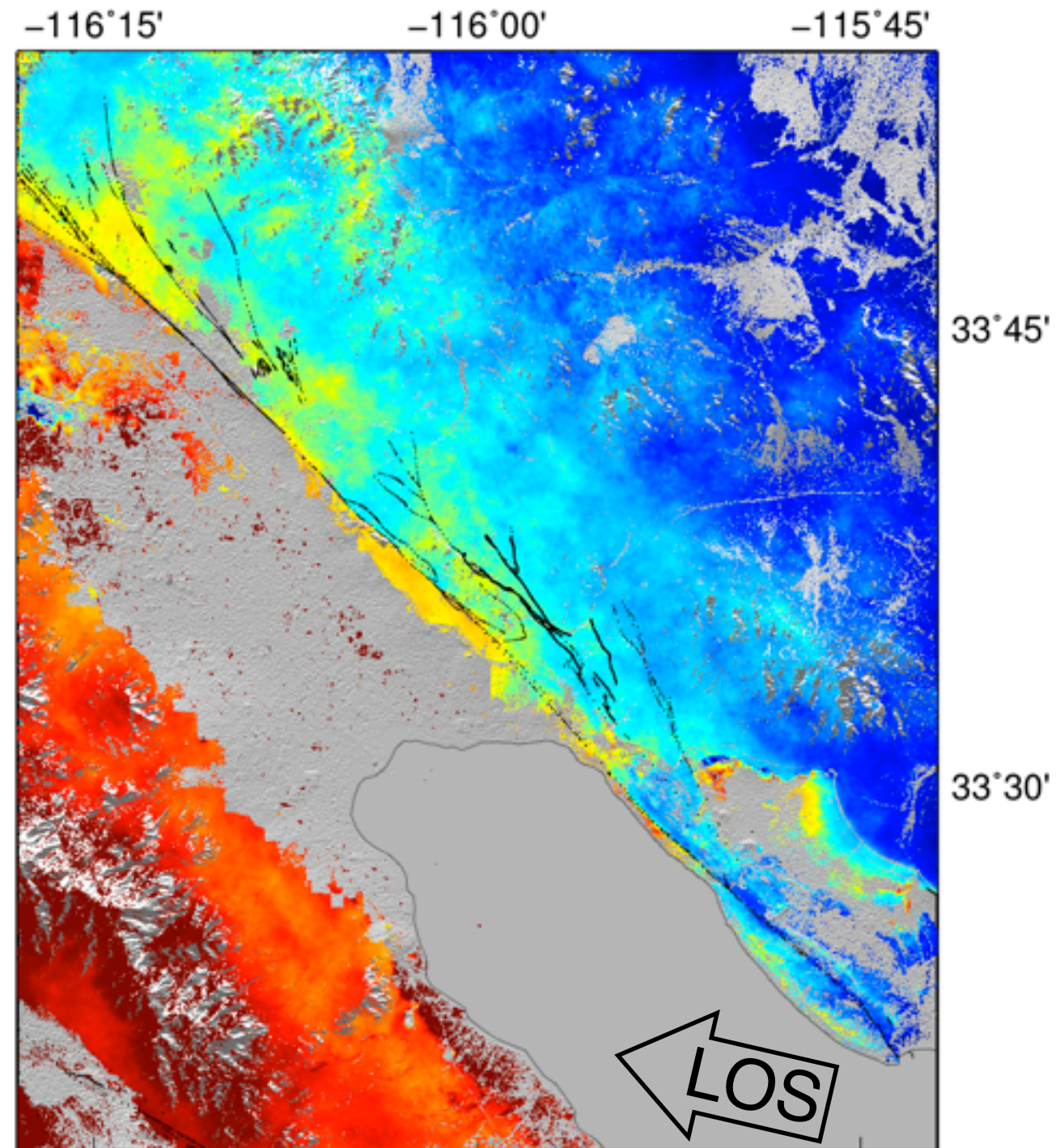
- Ignores time dependence, fault-normal motion

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T77 Ascending



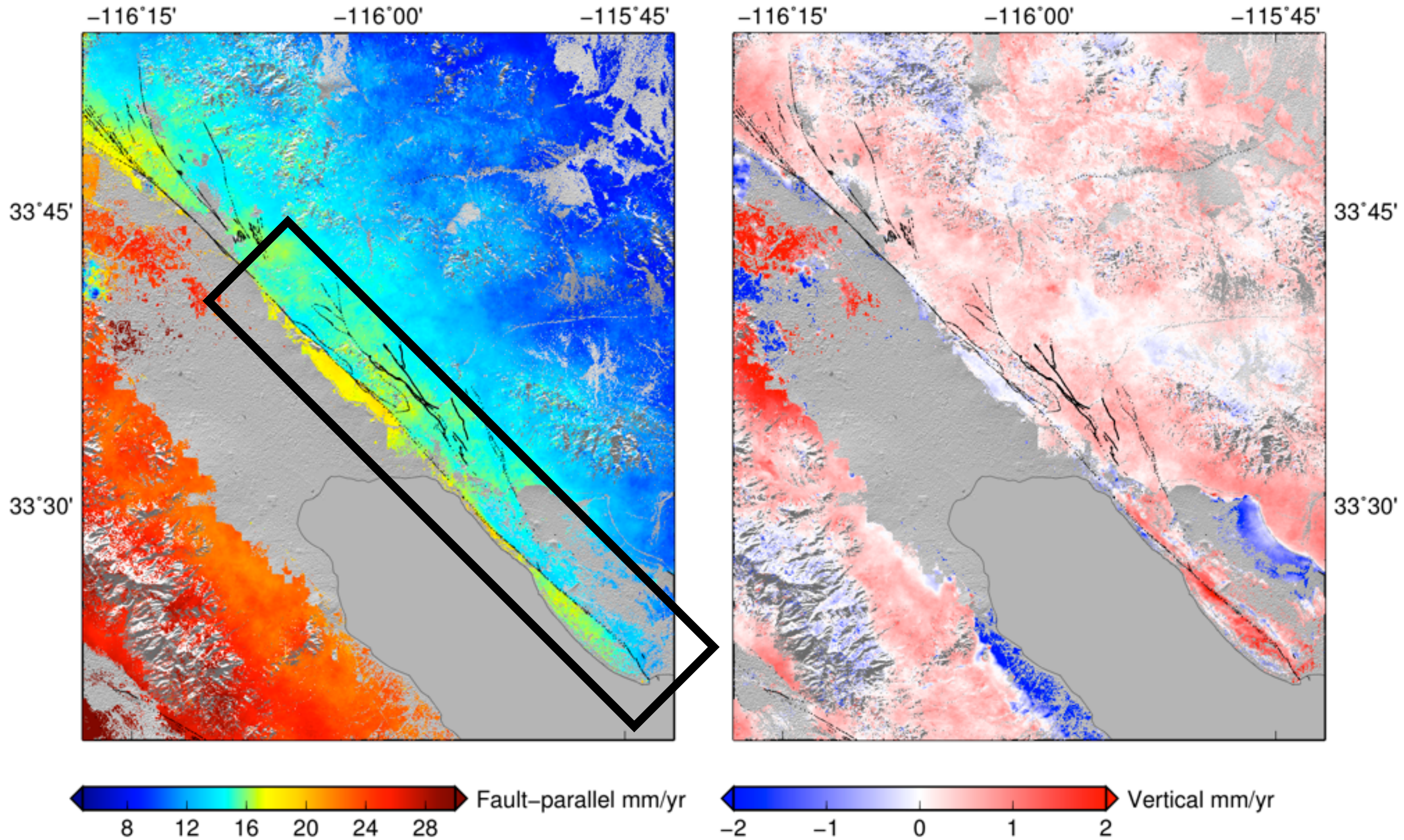
T356 Descending



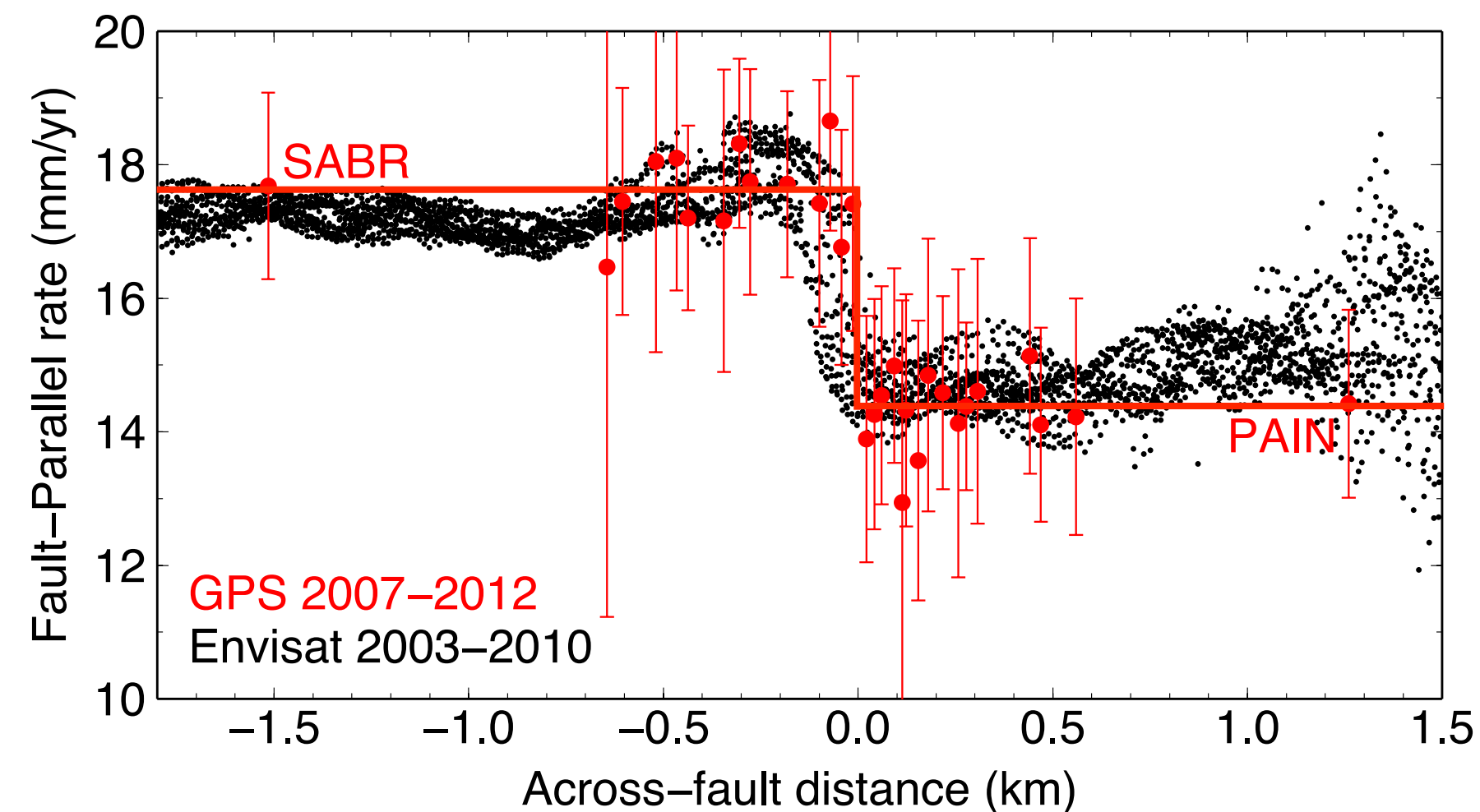
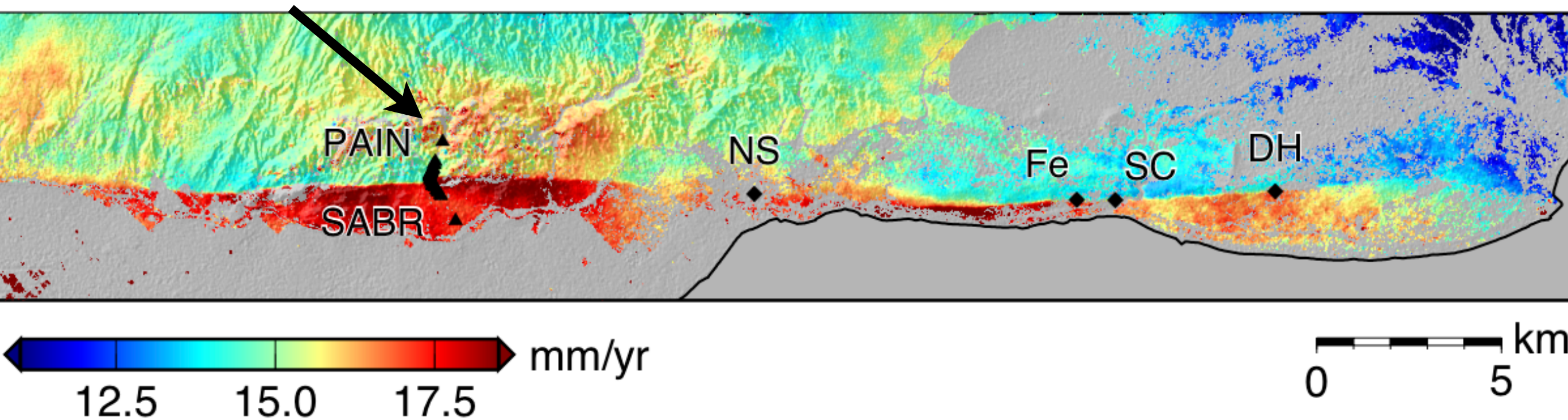
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Fault-parallel

Vertical



GPS validation

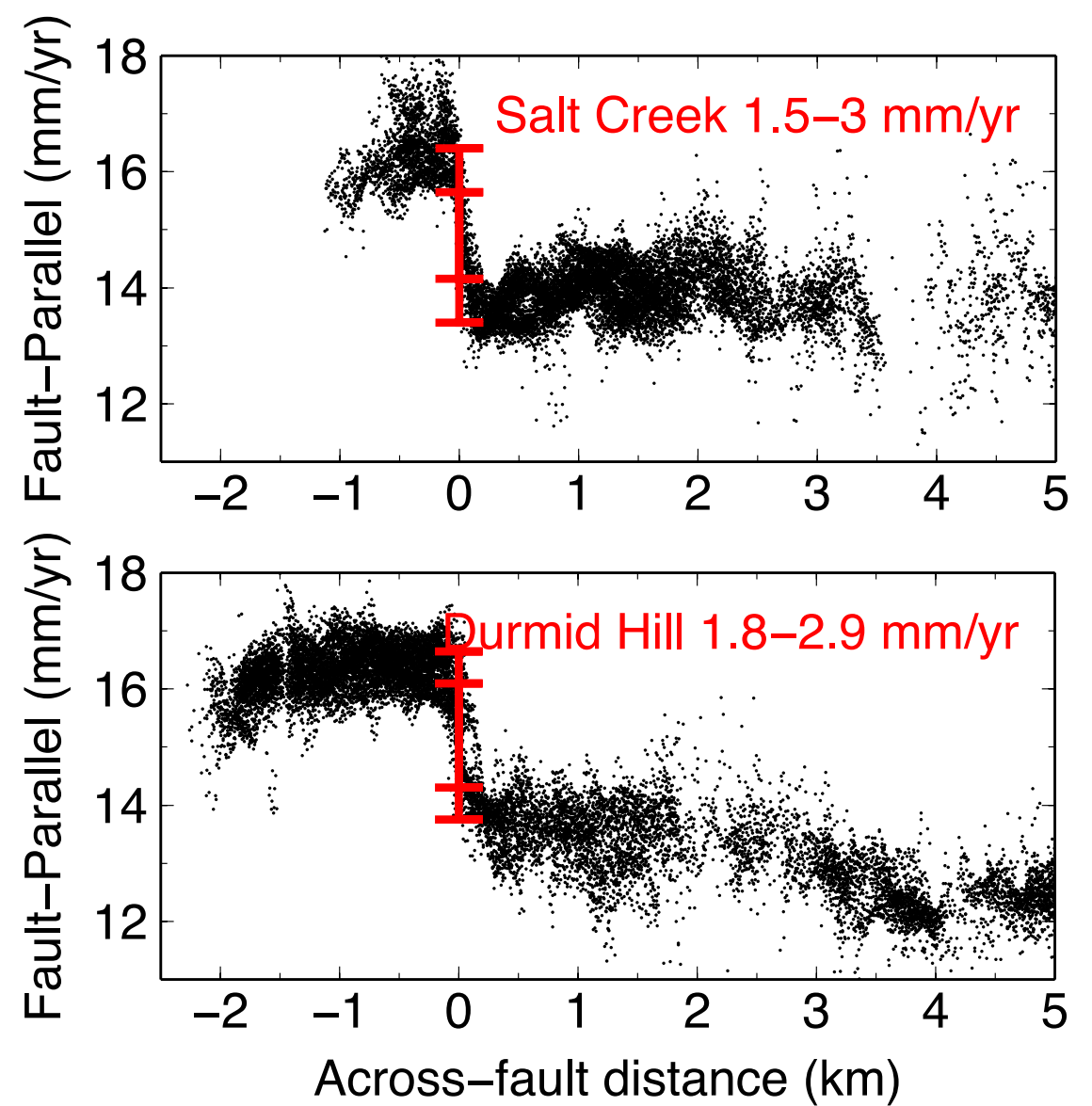
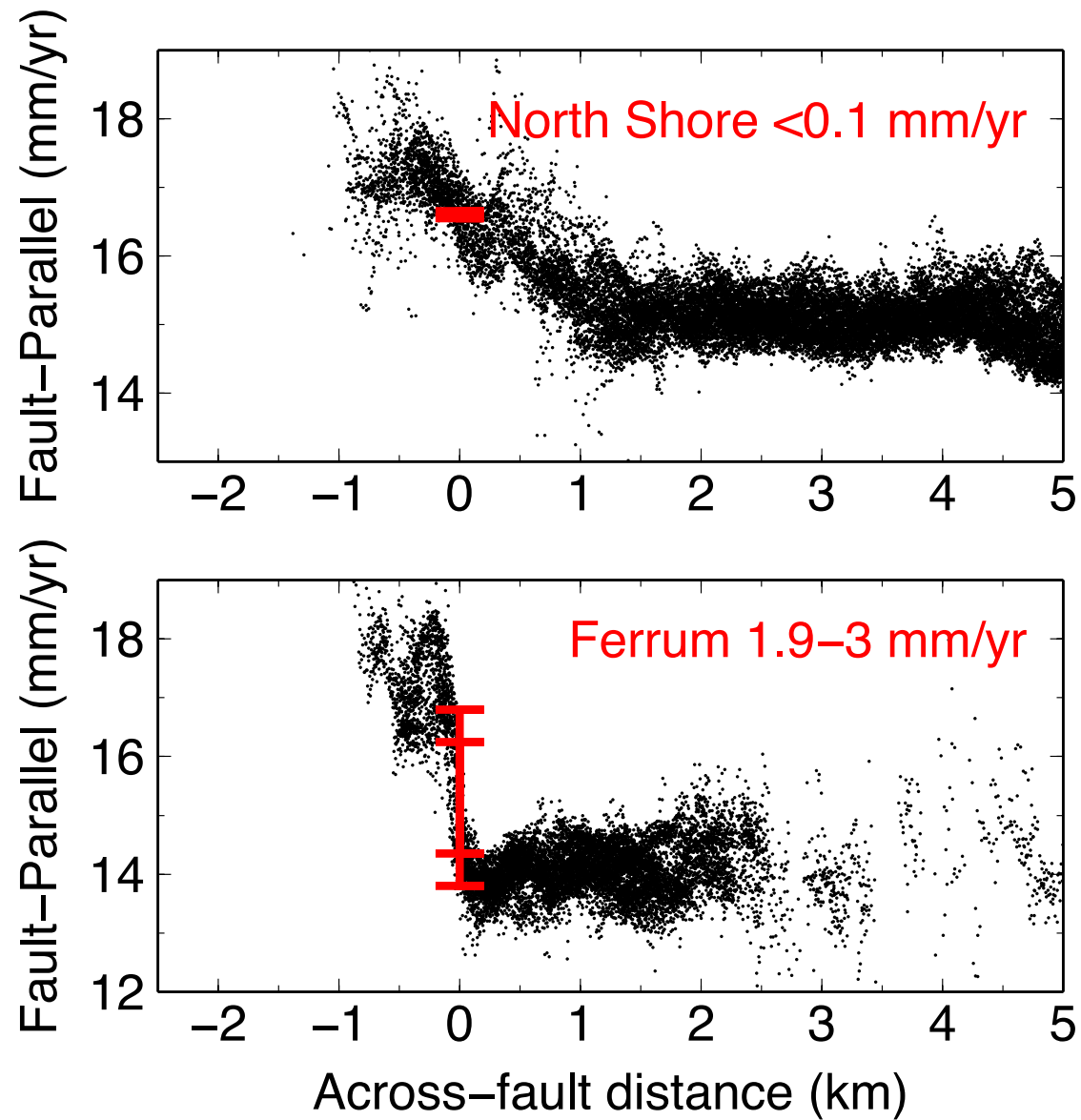
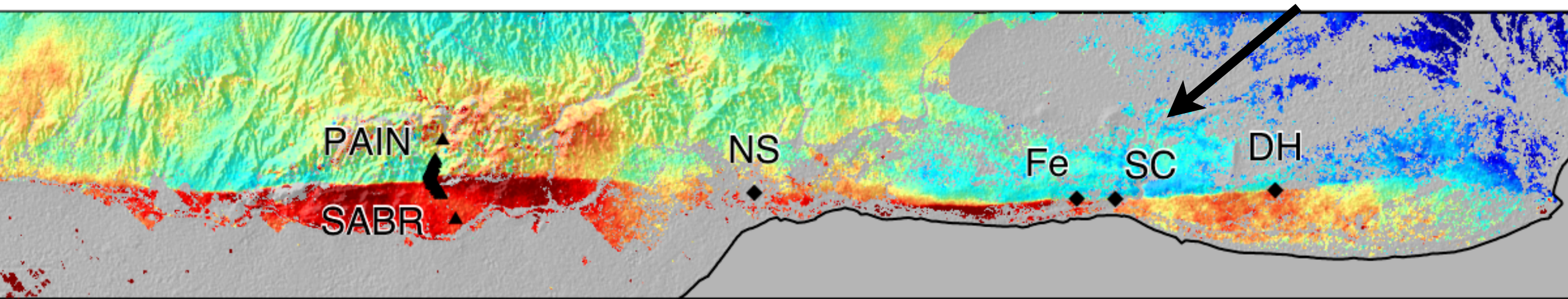


Re-occupied UCSB
level line 2007-2012

28 sites within 1km

GPS: Creep rate
 3.2 ± 1 mm/yr

Creep meters



Future directions

- Spatial pattern is well resolved by InSAR
- Where do we need more look directions?
- What spatial resolution / filtering is appropriate?
- Time dependence of creep?

