

Explicit landslide characterization using high-resolution and multi-trajectory airborne UAVSAR data

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NCALM

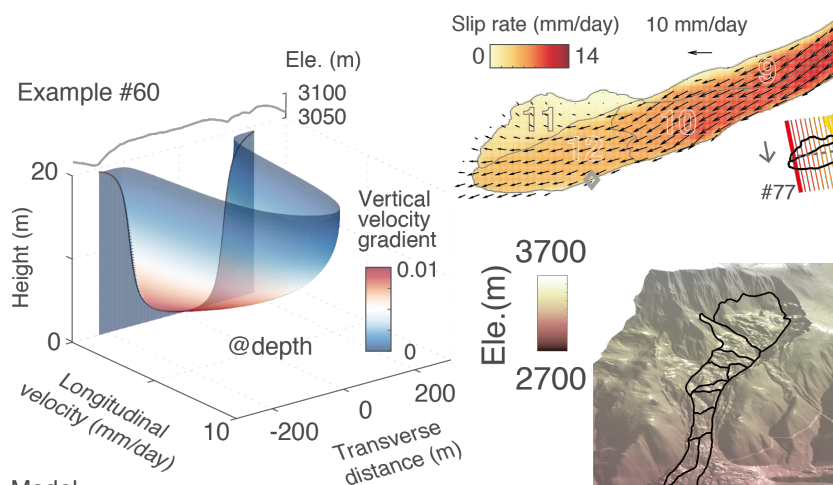
Slumgullion landslide, CO

1-2 cm/day movements for ~300 years

UAVSAR (Hybrid InSAR + pixel offset tracking method)

Sentinel-1

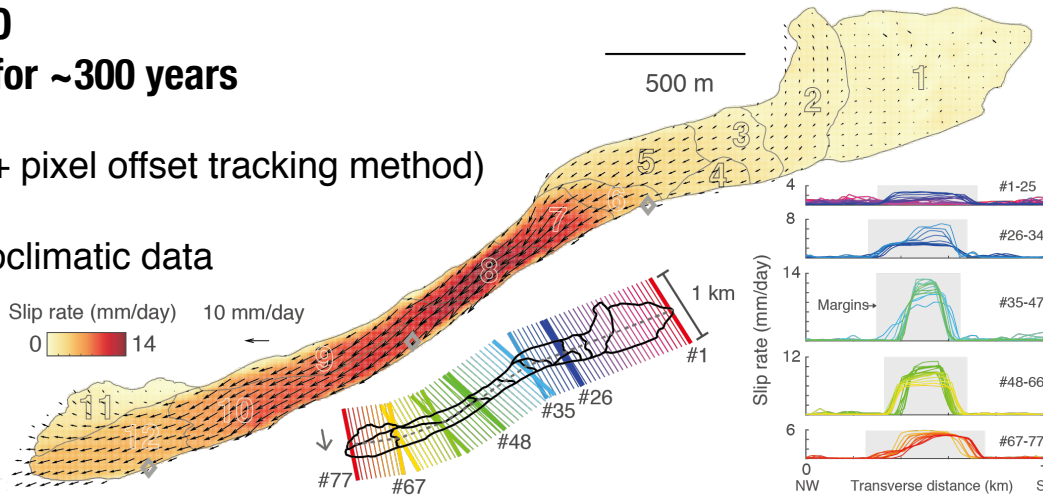
In-situ geodetic and hydroclimatic data



Model

SAR observation

Power-law non-Newtonian model:
invert for the slope channel
geometry, surface & subsurface
velocity.



1. Hydrological forcings: seasonal/multiannual rate changes; spatially varying sensitivity

2. Kinematic forcings: ground surface pull-apart basins help establish a secondary minislide; subsurface slope channel modulation in depth, lateral steepness, and the tilt of basal bed

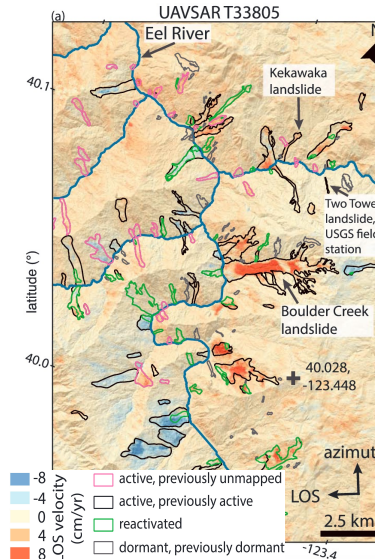
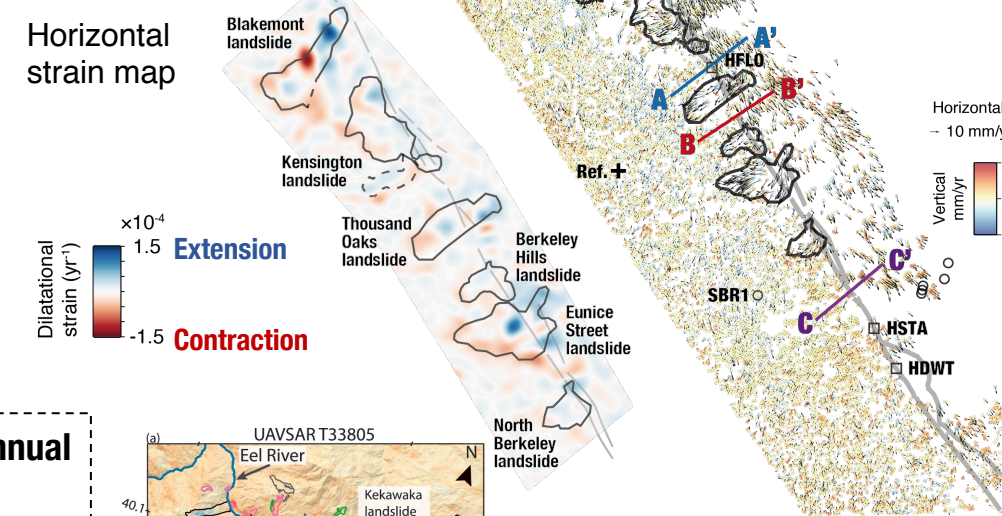
3. Landslide-fault interaction: abrupt changes in displacement velocities and directions; horizontal strain rate distribution; creeping fault kinematics

East SF Bay, CA

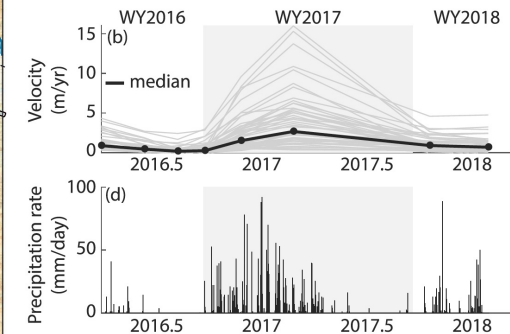
Berkeley Hill landslides

Creeping Hayward fault

Horizontal
strain map



Eel River catchment, CA



Handwerger et al., 2019
Hu et al., 2020; Hu et al., under review