

Large Scale Interferometric Processing of Sentinel-1 Data over the Atacama Desert – a Contribution to the TecVolSA Project

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Fringe 2021

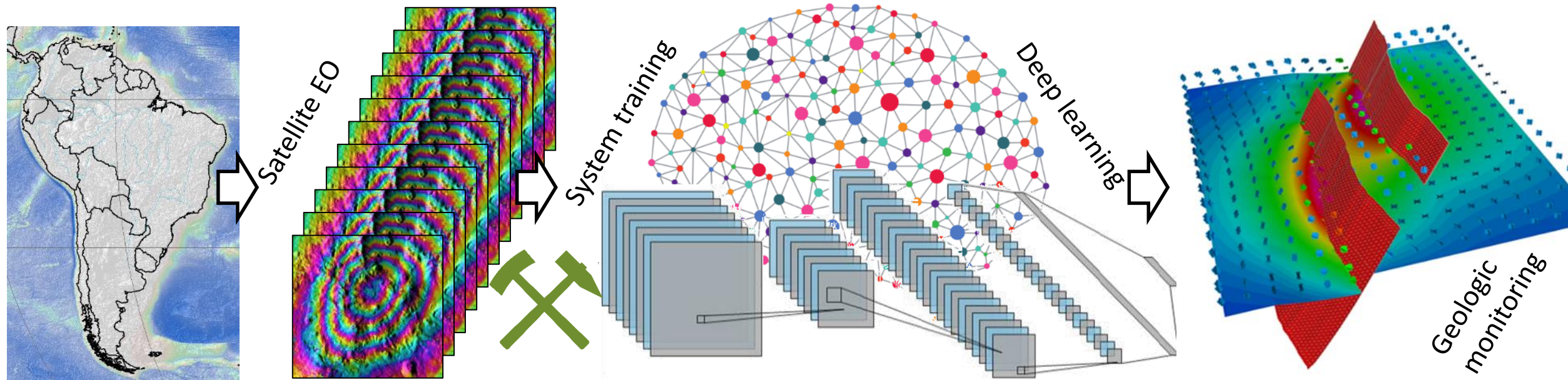
HELMHOLTZ
RESEARCH FOR GRAND CHALLENGES



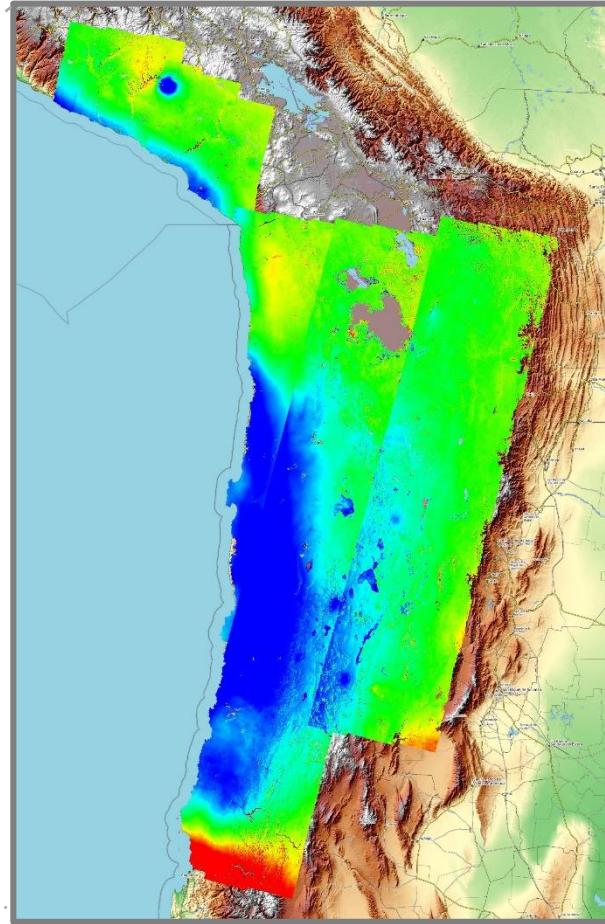
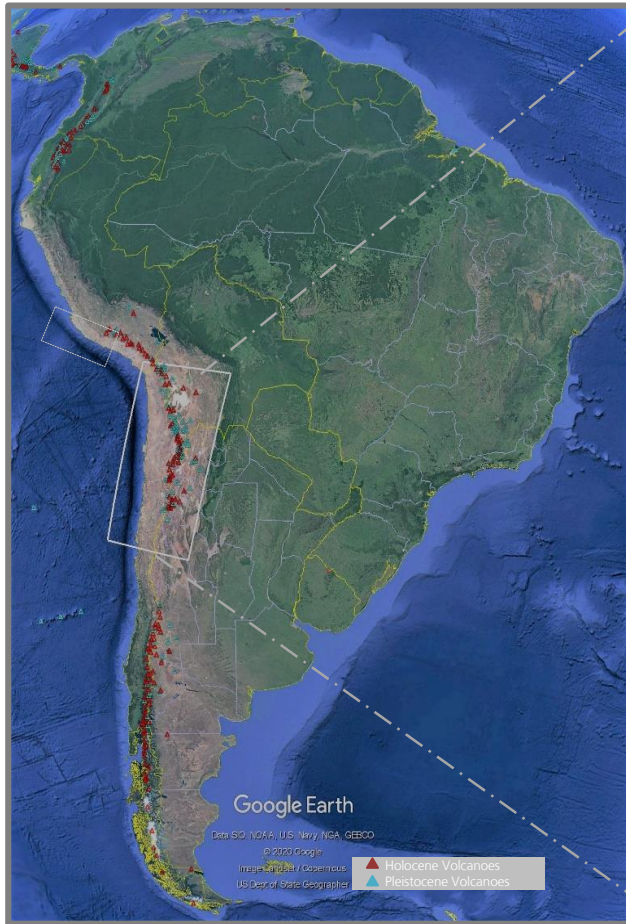
Knowledge for Tomorrow



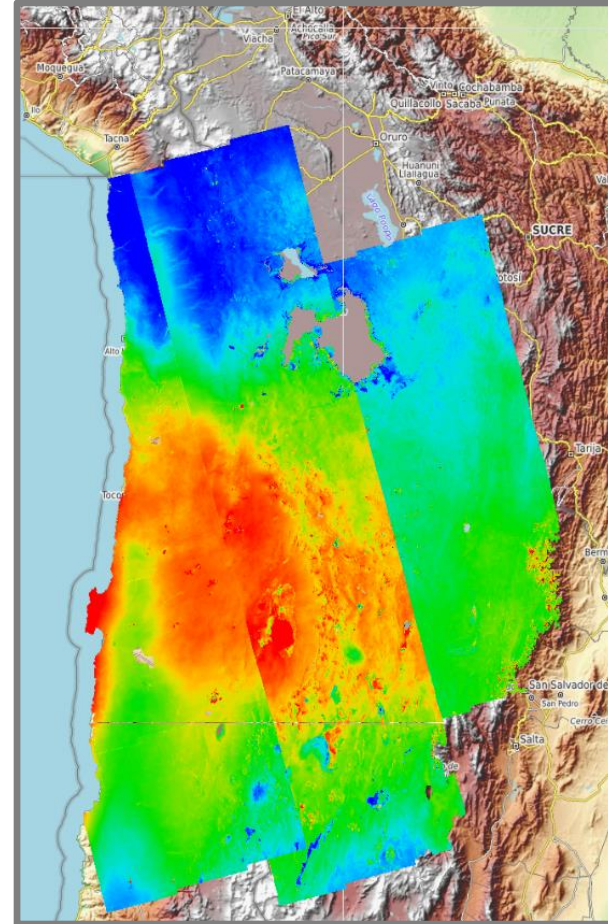
Sentinel-1 InSAR products + Geophysical knowledge + Deep Learning => automatic detection and classification of motion sources



Mean velocity maps from InSAR (no GNSS calibration)



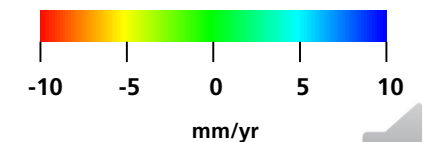
Descending Geometry



Ascending Geometry

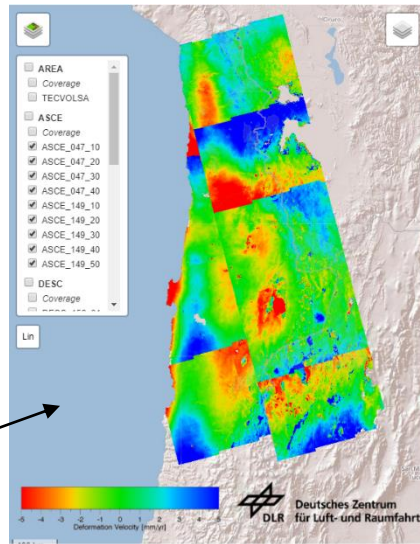
~50 Sentinel-1 slices

PS/DS processing,
with tropospheric and
ionospheric
corrections

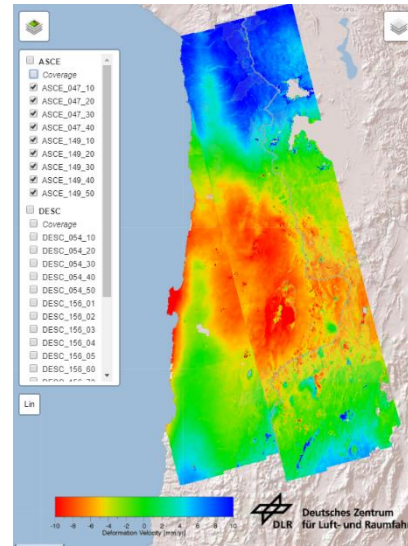
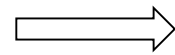


Large area PS/DS-processing + Along-track mosaicking + GPS calibration

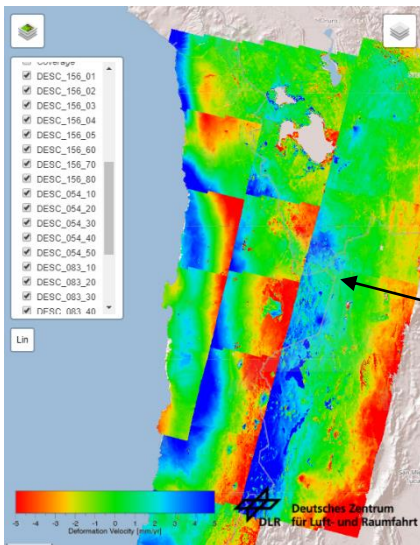
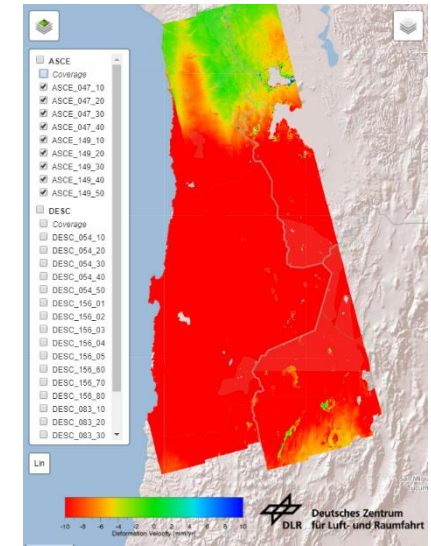
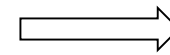
Relative LoS
defo rate



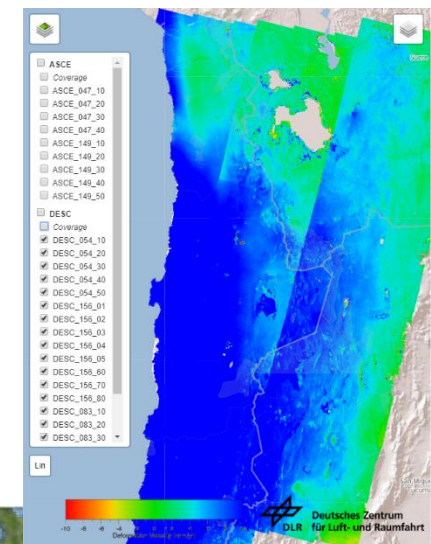
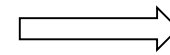
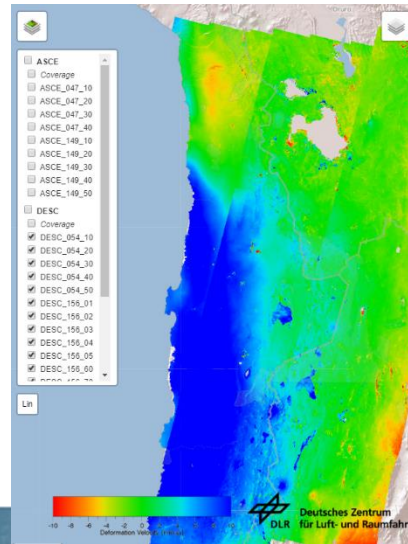
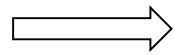
Azimuth
mosaicking



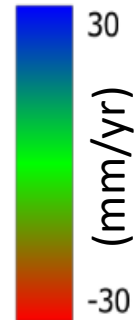
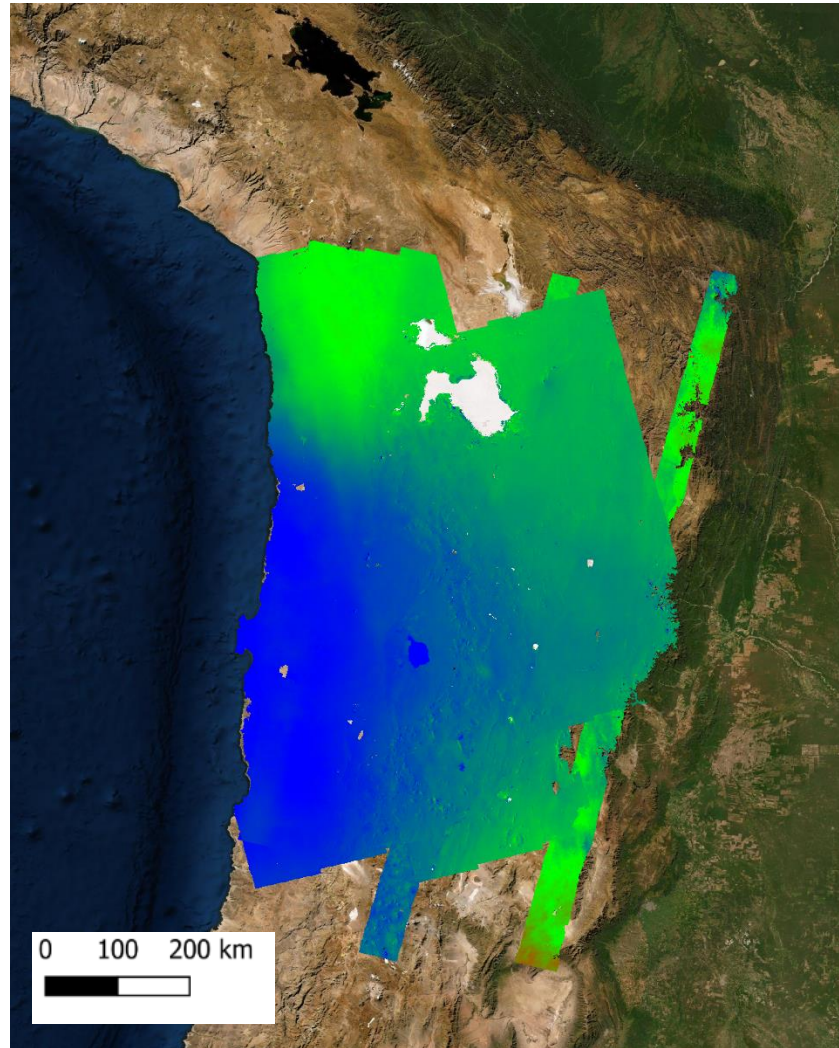
GPS calibration
(absolute LoS
deformation rate)



descending,
right-looking



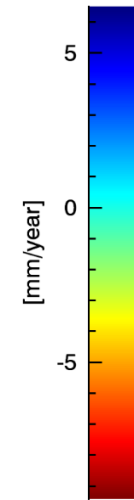
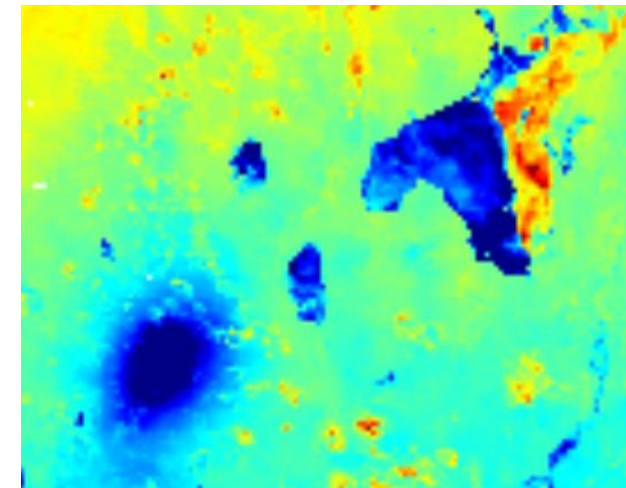
Mean velocity inverted for East and vertical motion



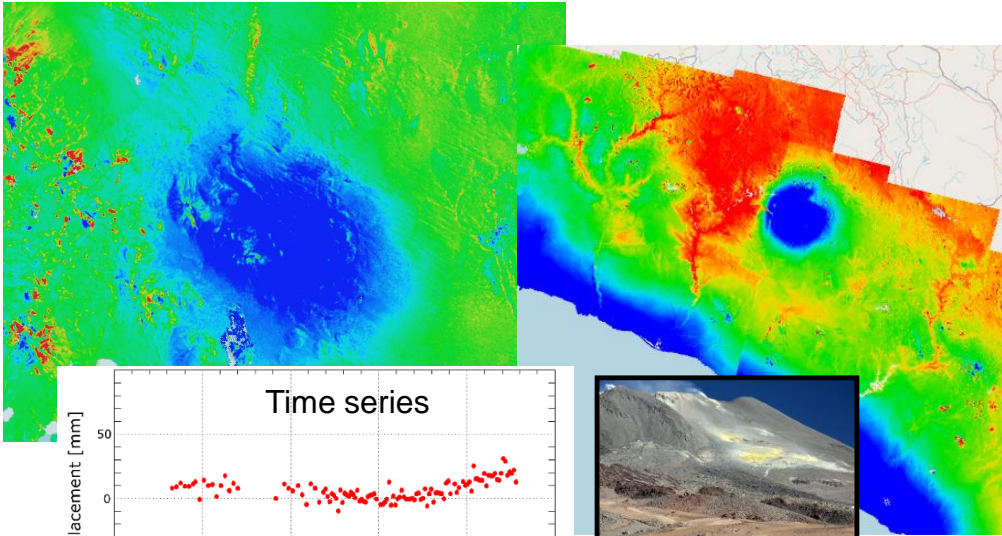
The vertical motion suffers from leakage from a large scale North component.

Anyway, there is a number of prominent local vertical signals, as on volcanoes or on salt lakes.

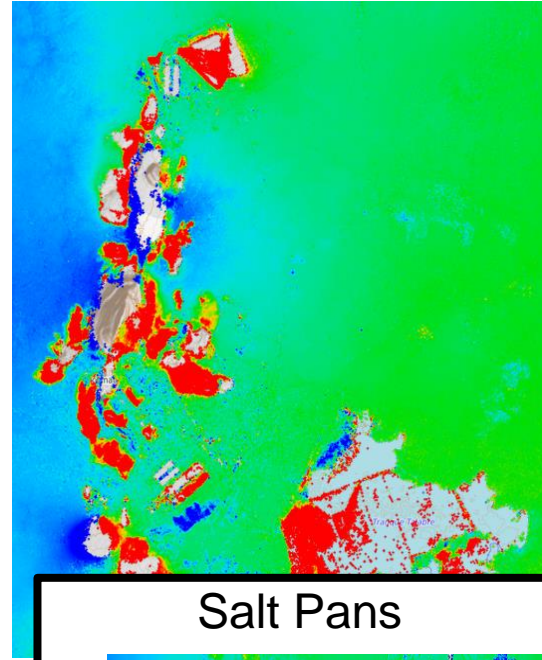
Local vertical deformation



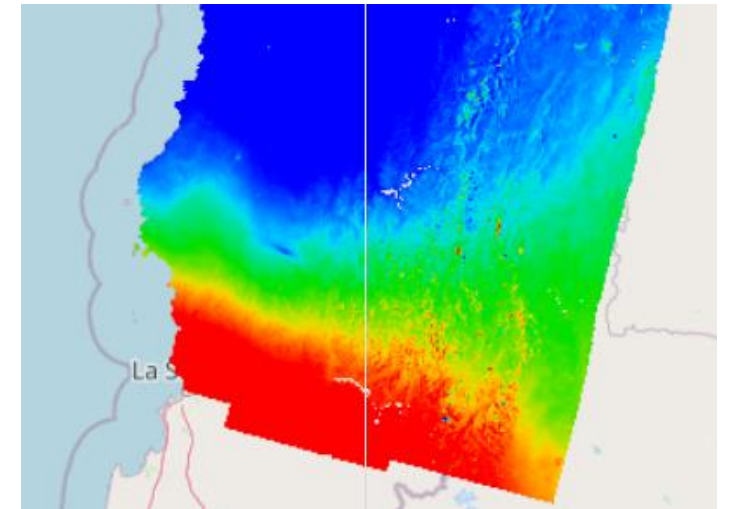
Volcanoes



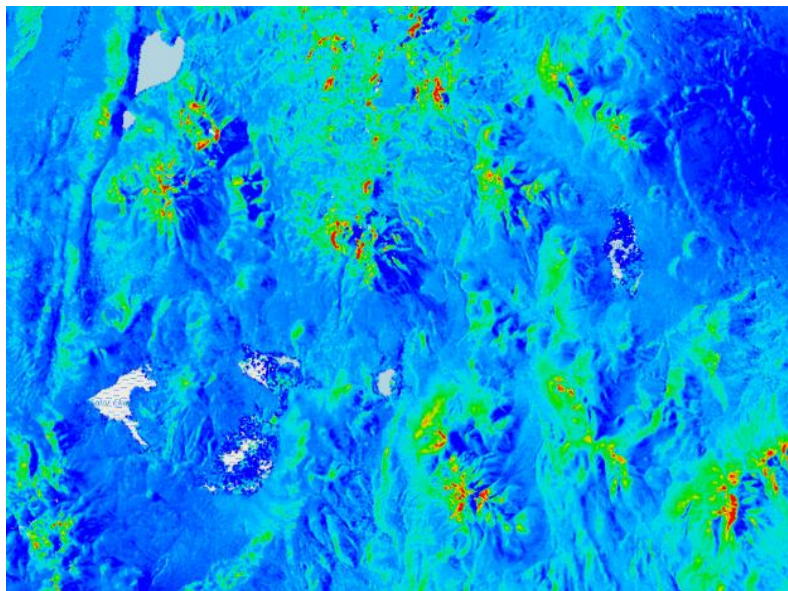
Mining



Earthquakes



Soil Creep



Salt Pans

