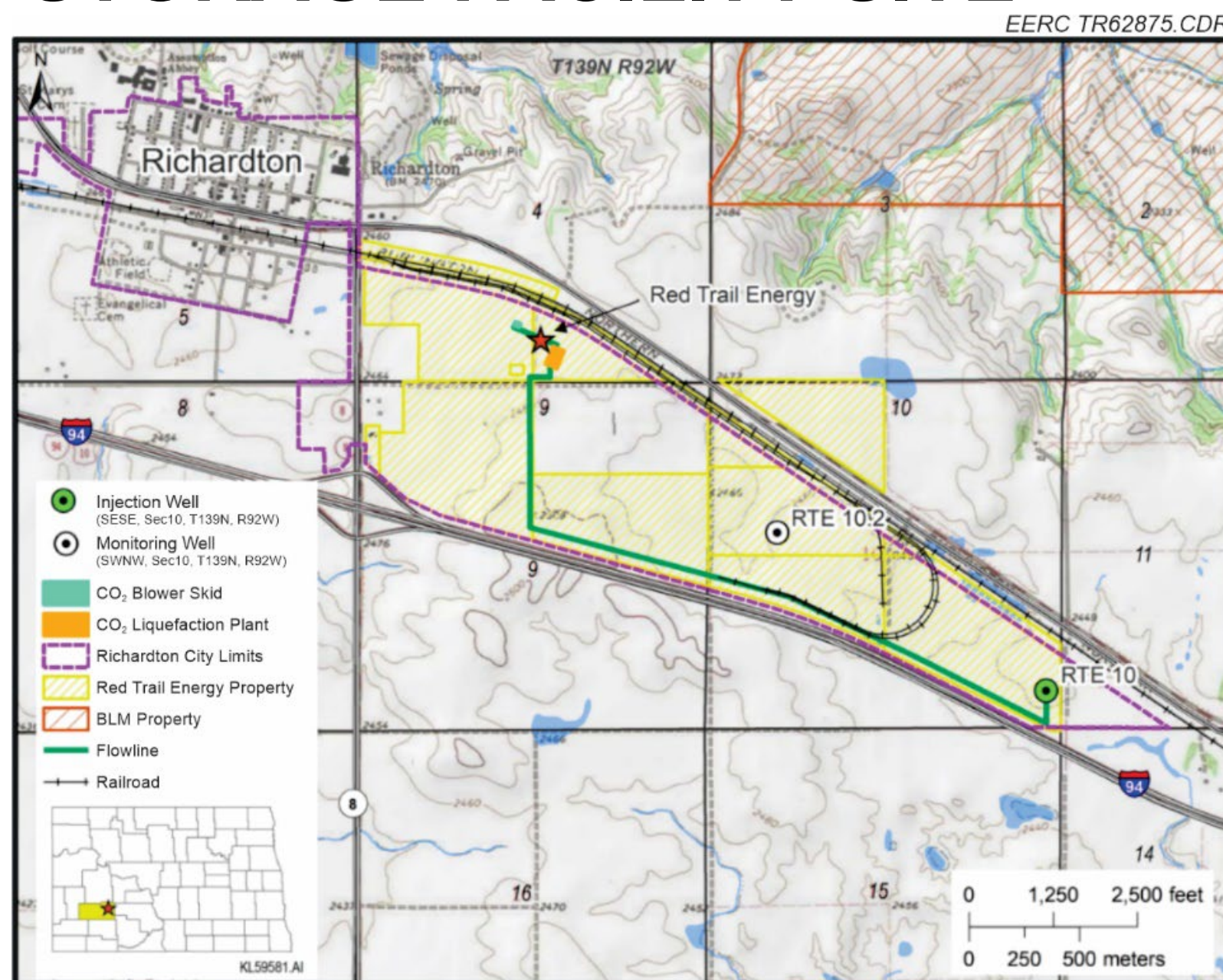


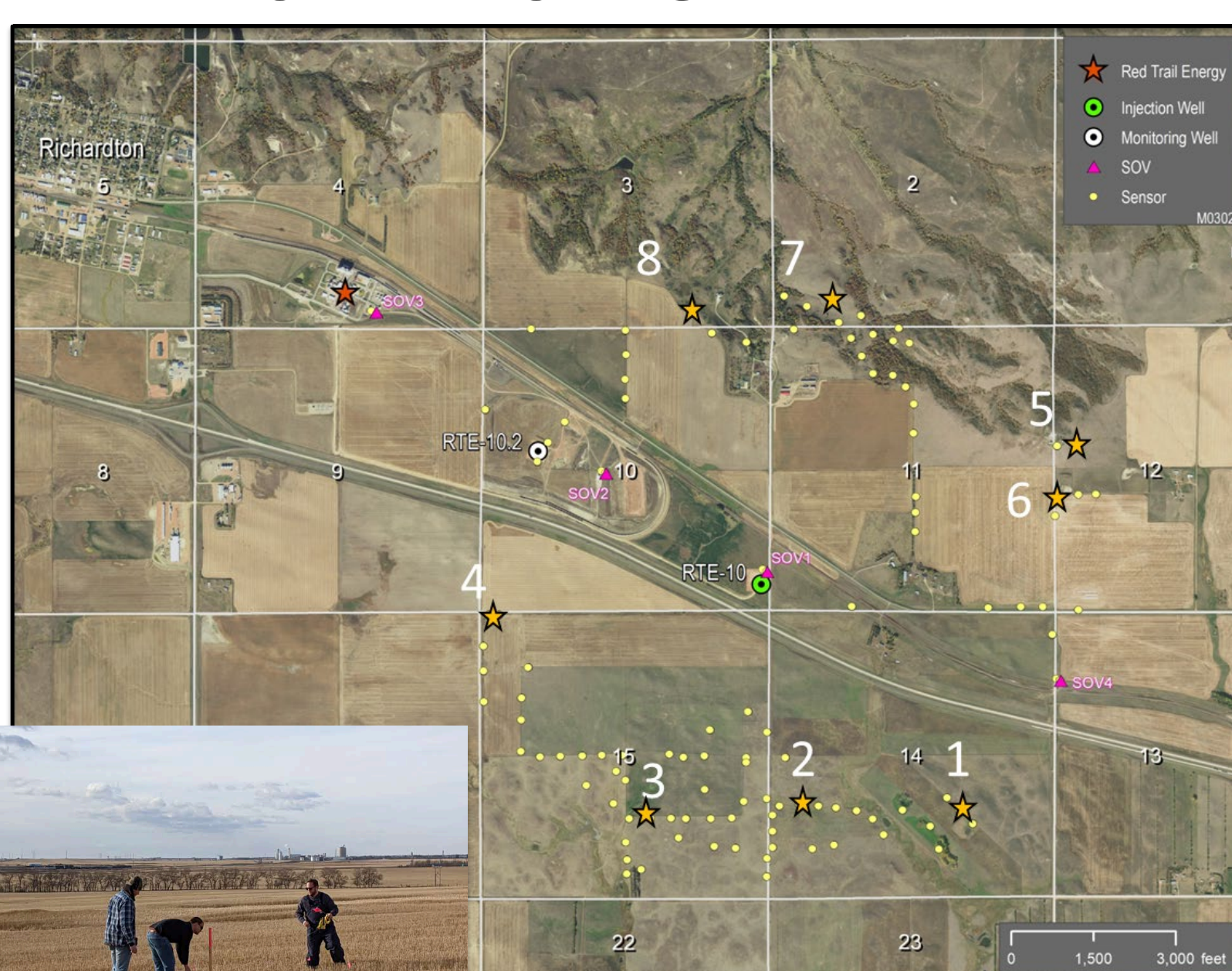


DEMONSTRATING NOVEL MONITORING TECHNIQUES AT AN ETHANOL 180,000-MT/YR CCS PROJECT IN NORTH DAKOTA

RED TRAIL ENERGY (RTE) STORAGE FACILITY SITE

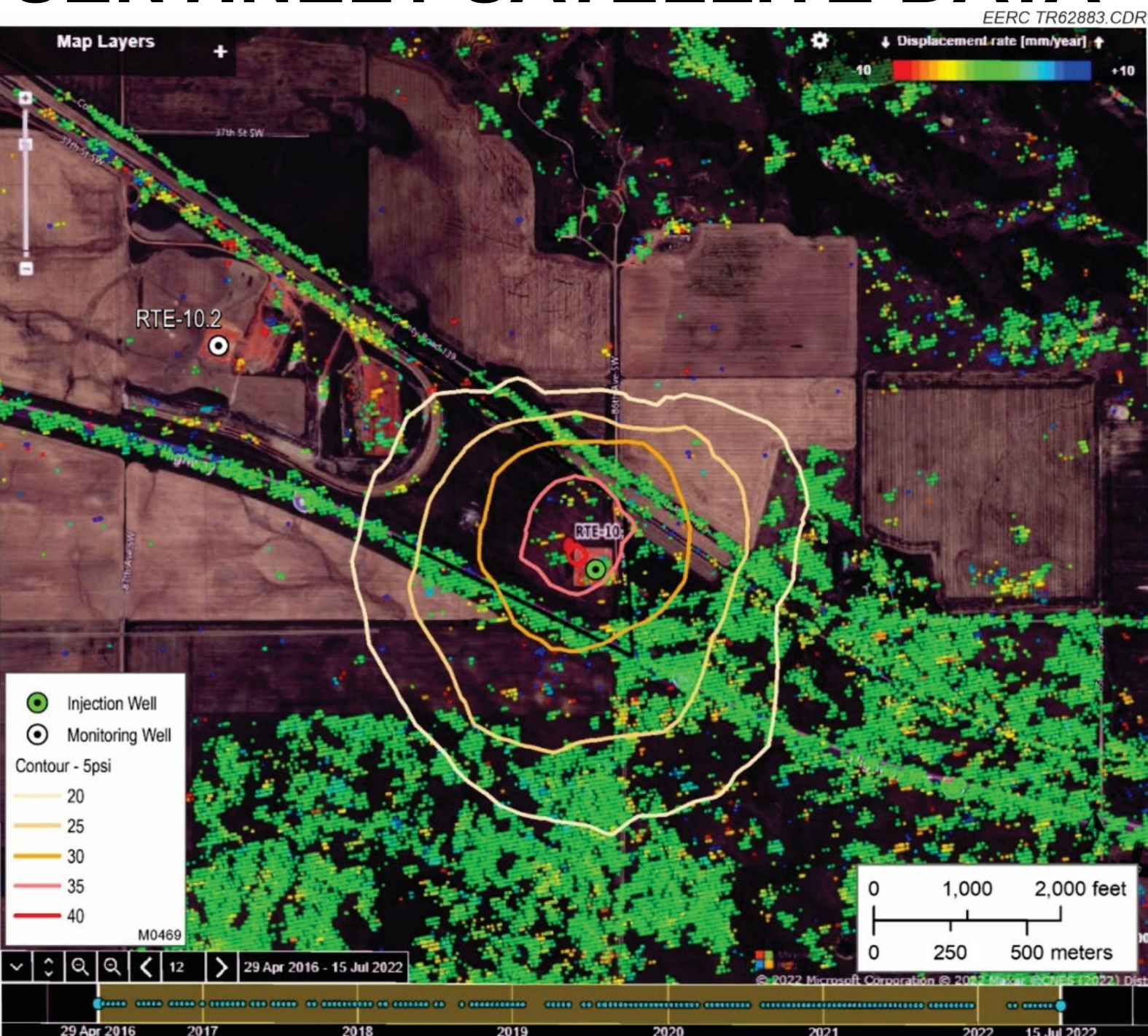


MAPPED SASSA* ARRAYS DEPLOYED ON-SITE

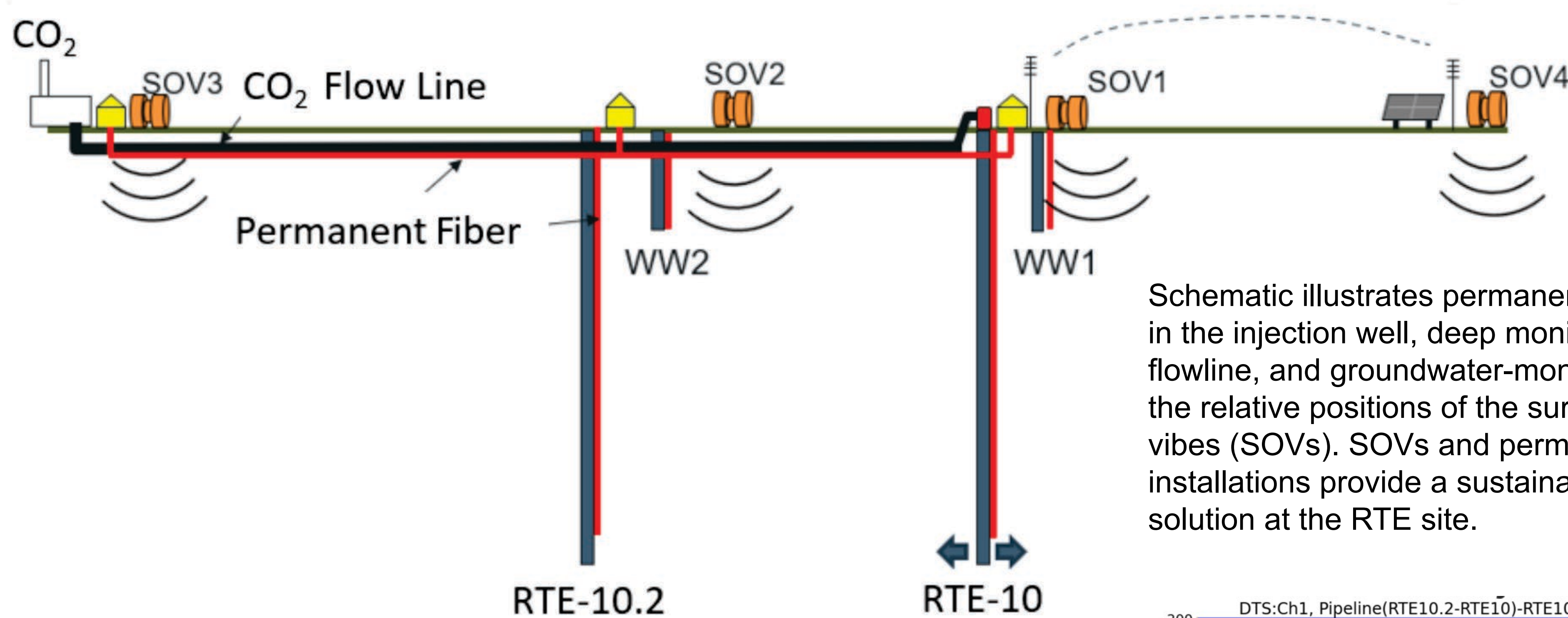


SOVs provide daily sourcing that is recorded on deployed sensors and permanently installed fiber.

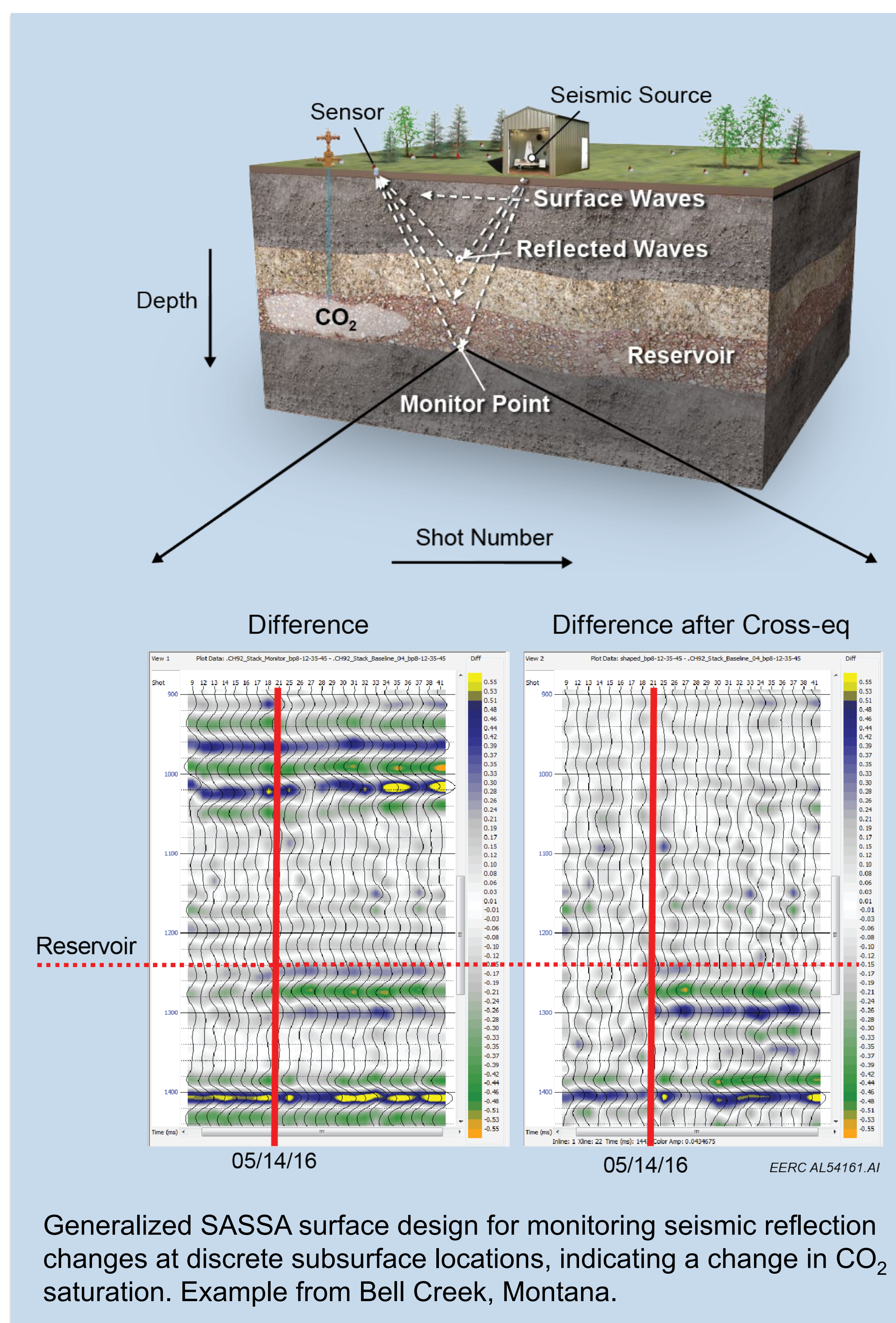
HISTORICAL ANALYSIS OF SENTINEL1 SATELLITE DATA



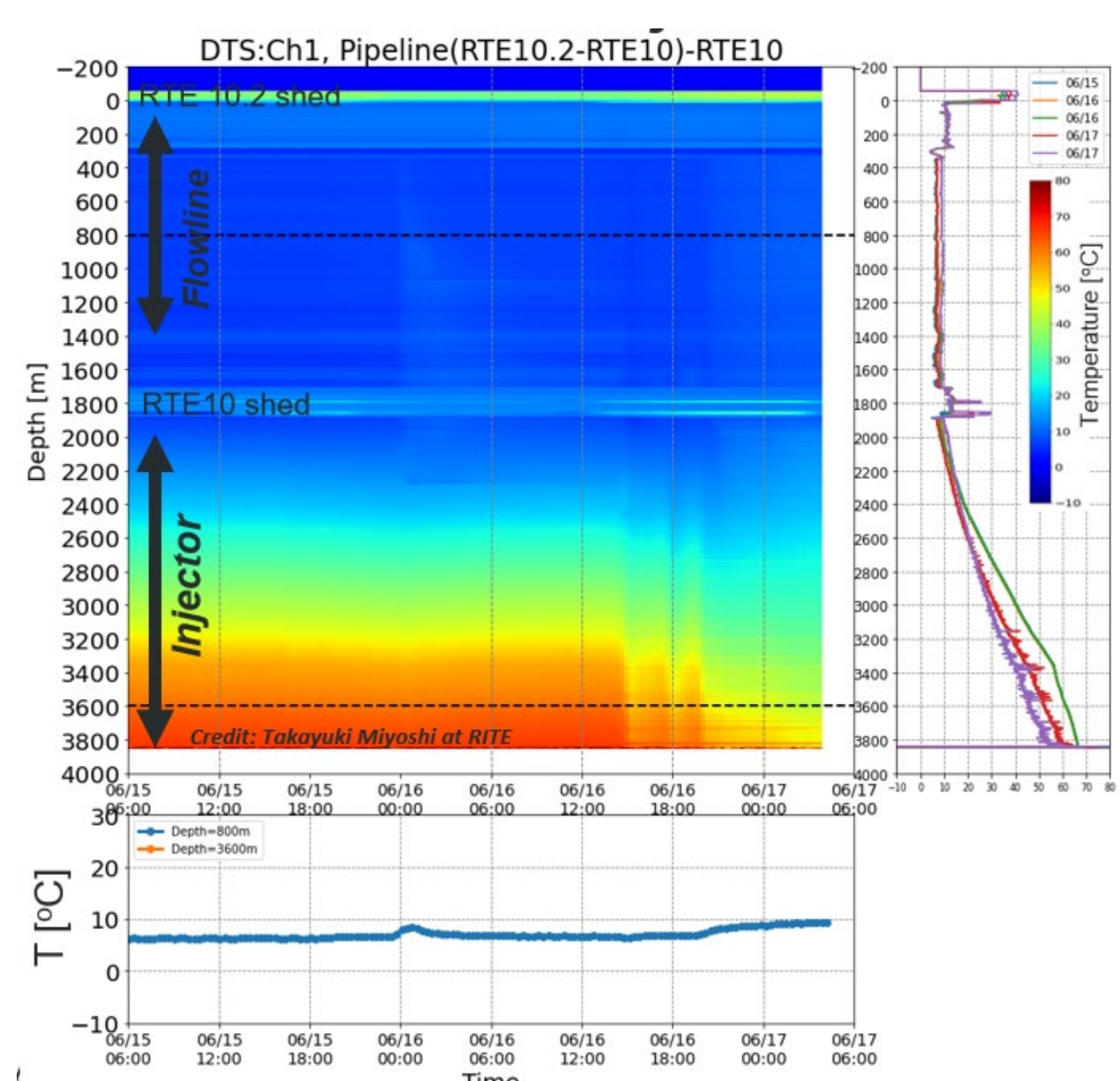
The illustration shows the simulated 5-and 20-year pressure plumes taken from the approved RTE (2021) Class VI well permit. Image credit: SkyGeo.



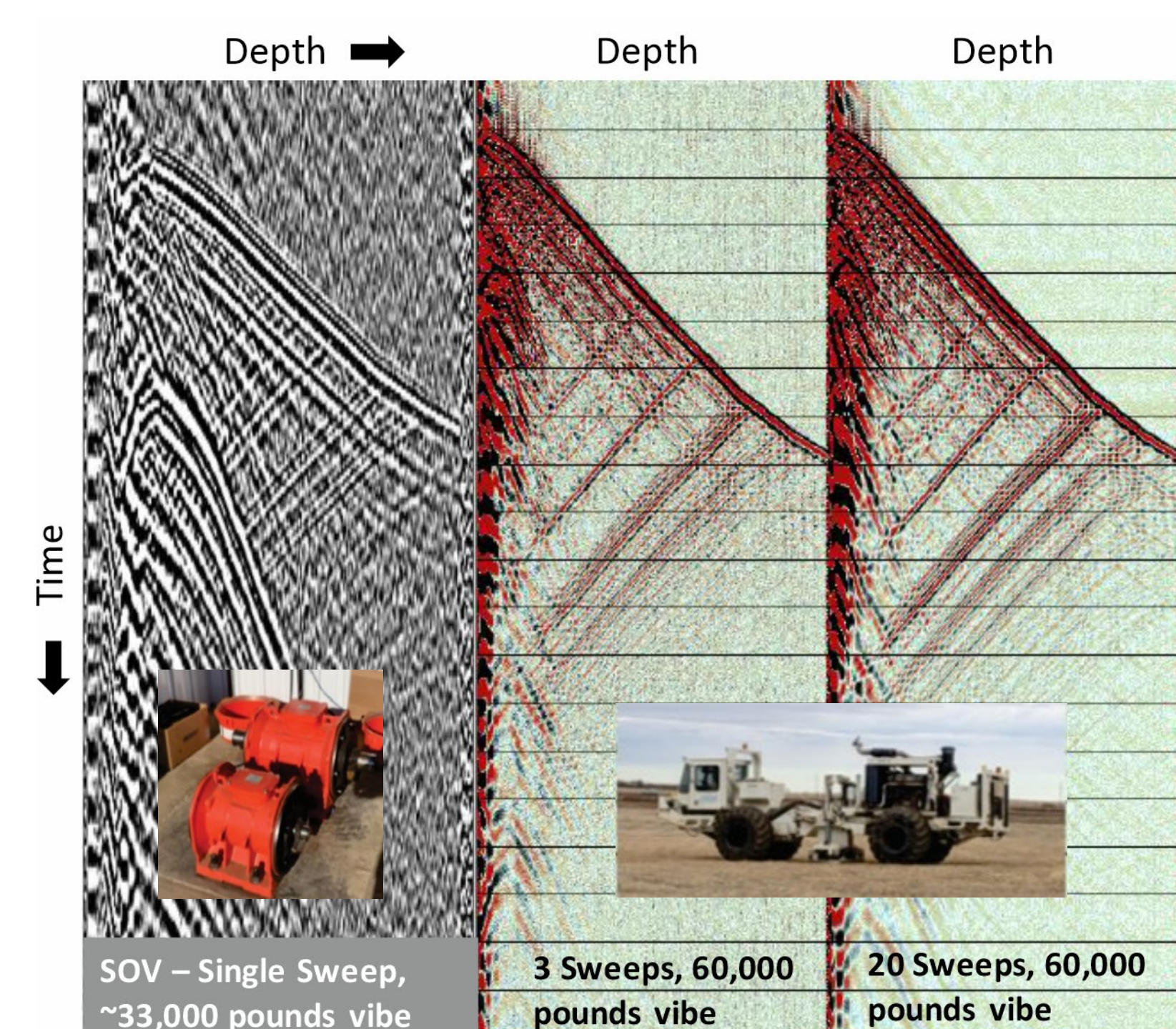
Schematic illustrates permanent fiber installed in the injection well, deep monitoring well, CO₂ flowline, and groundwater-monitoring wells and the relative positions of the surface orbital vibes (SOVs). SOVs and permanent fiber installations provide a sustainable monitoring solution at the RTE site.



Generalized SASSA surface design for monitoring seismic reflection changes at discrete subsurface locations, indicating a change in CO₂ saturation. Example from Bell Creek, Montana.



Distributed temperature sensing shows the temperature reduction in the injection well after a few days of initial injection tests.



Comparison of SOV with conventional large vibroseis truck shows great data quality with both source types. The SOV installation (shown on the right) is secured to its foundation inside a shed to reduce cultural noise and protect the equipment from the elements.