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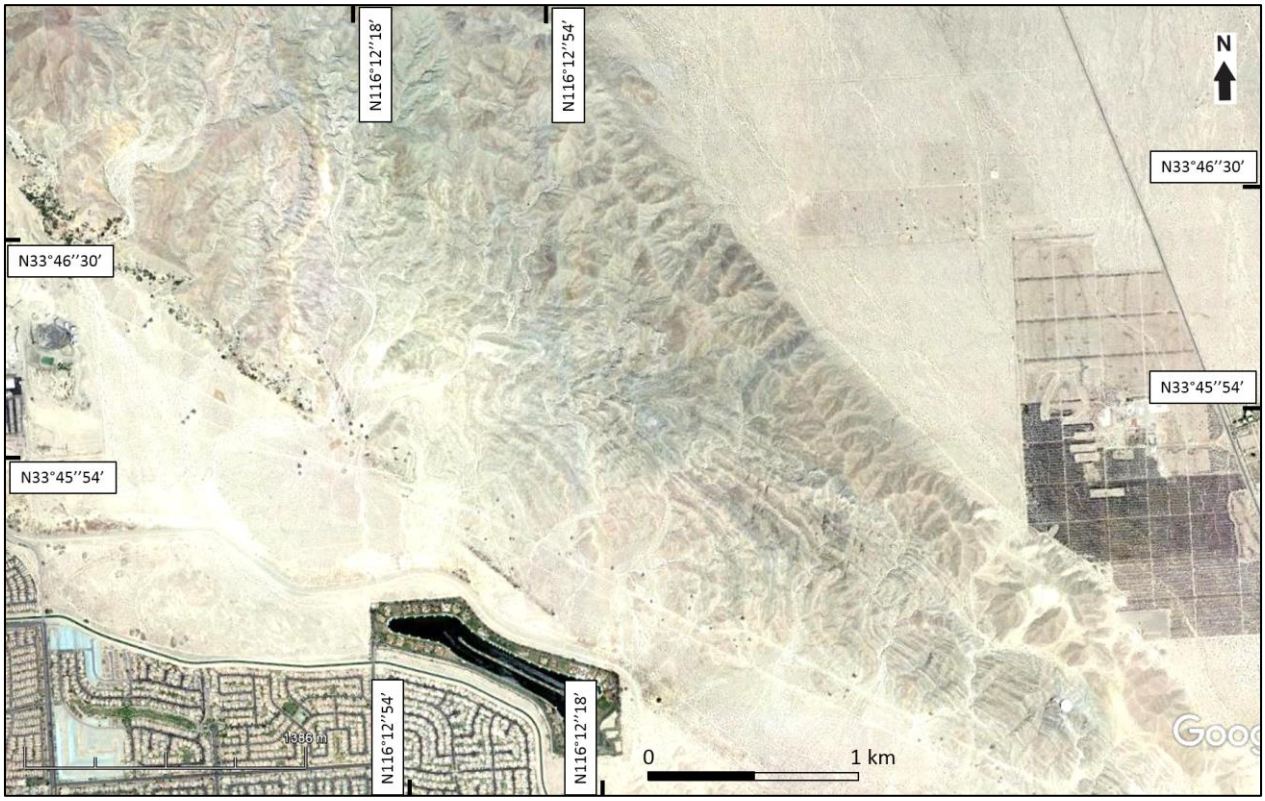
*Supplement of*

# Tectonic evolution of the Indio Hills segment of the San Andreas fault in southern California, southwestern USA

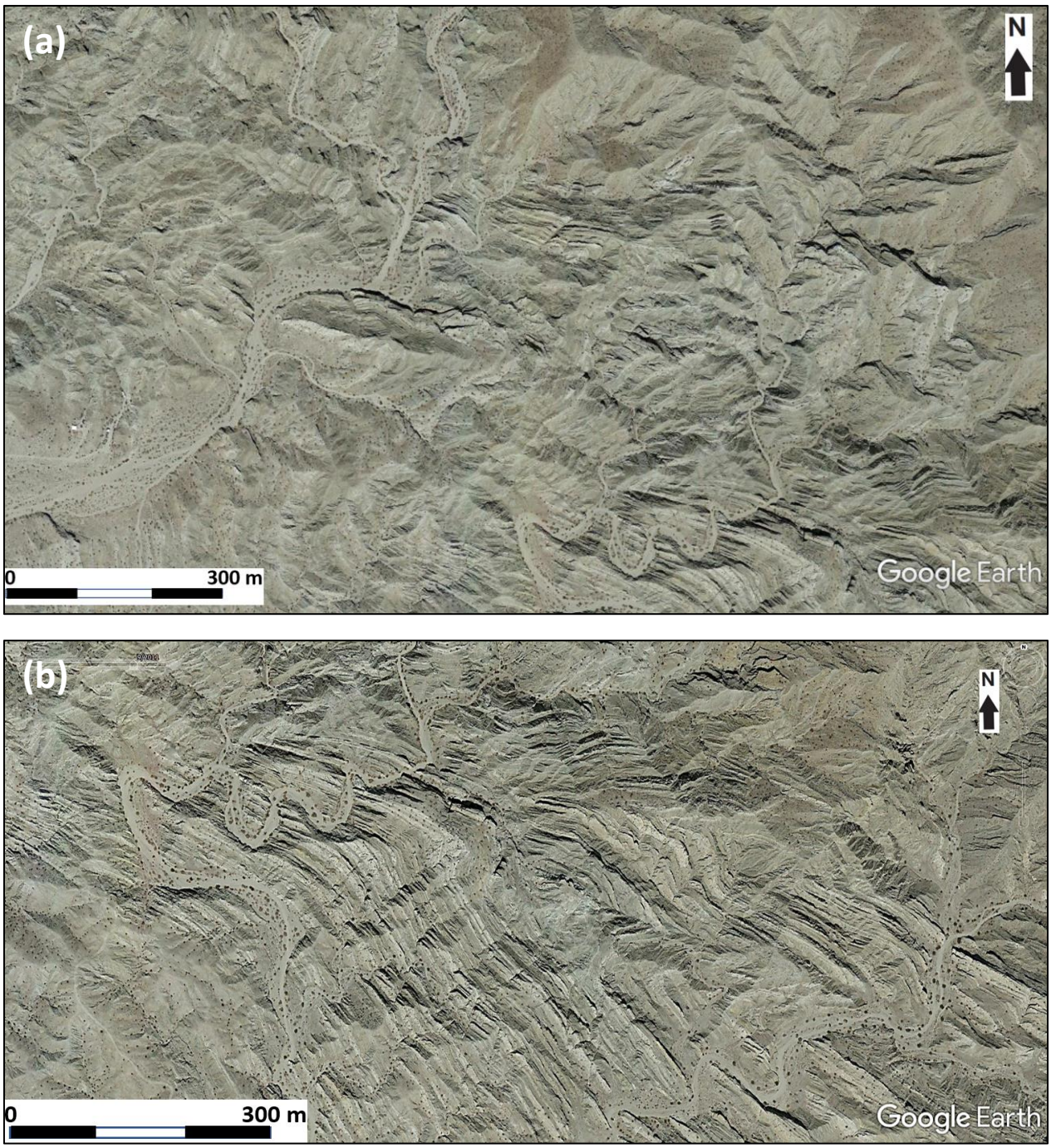
**Jean-Baptiste P. Koehl et al.**

*Correspondence to:* Jean-Baptiste P. Koehl (jeanbaptiste.koehl@gmail.com)

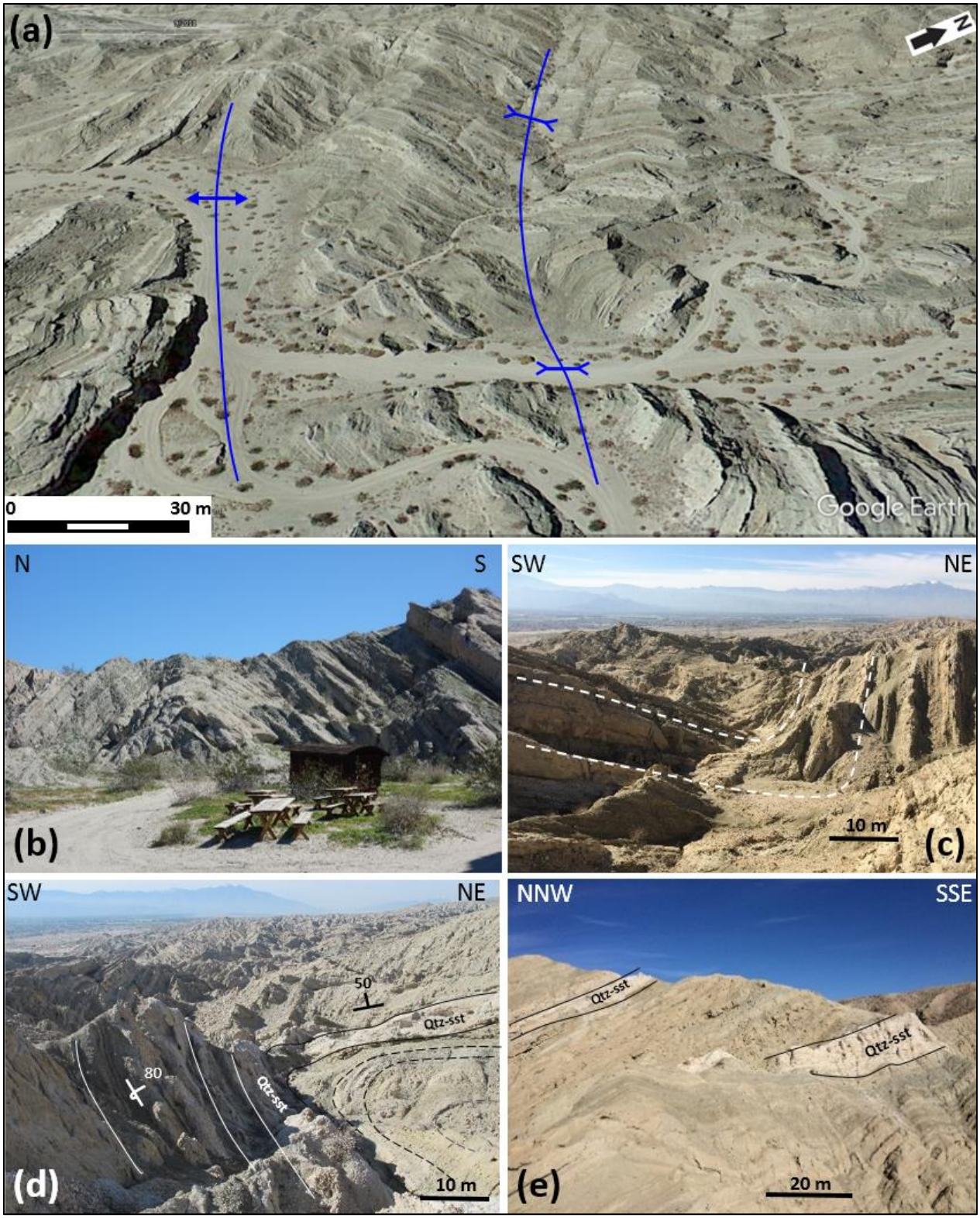
## Supplements




**S1: Uninterpreted Fig. 2. See Fig. 1 for location. © Google Earth 2011.**

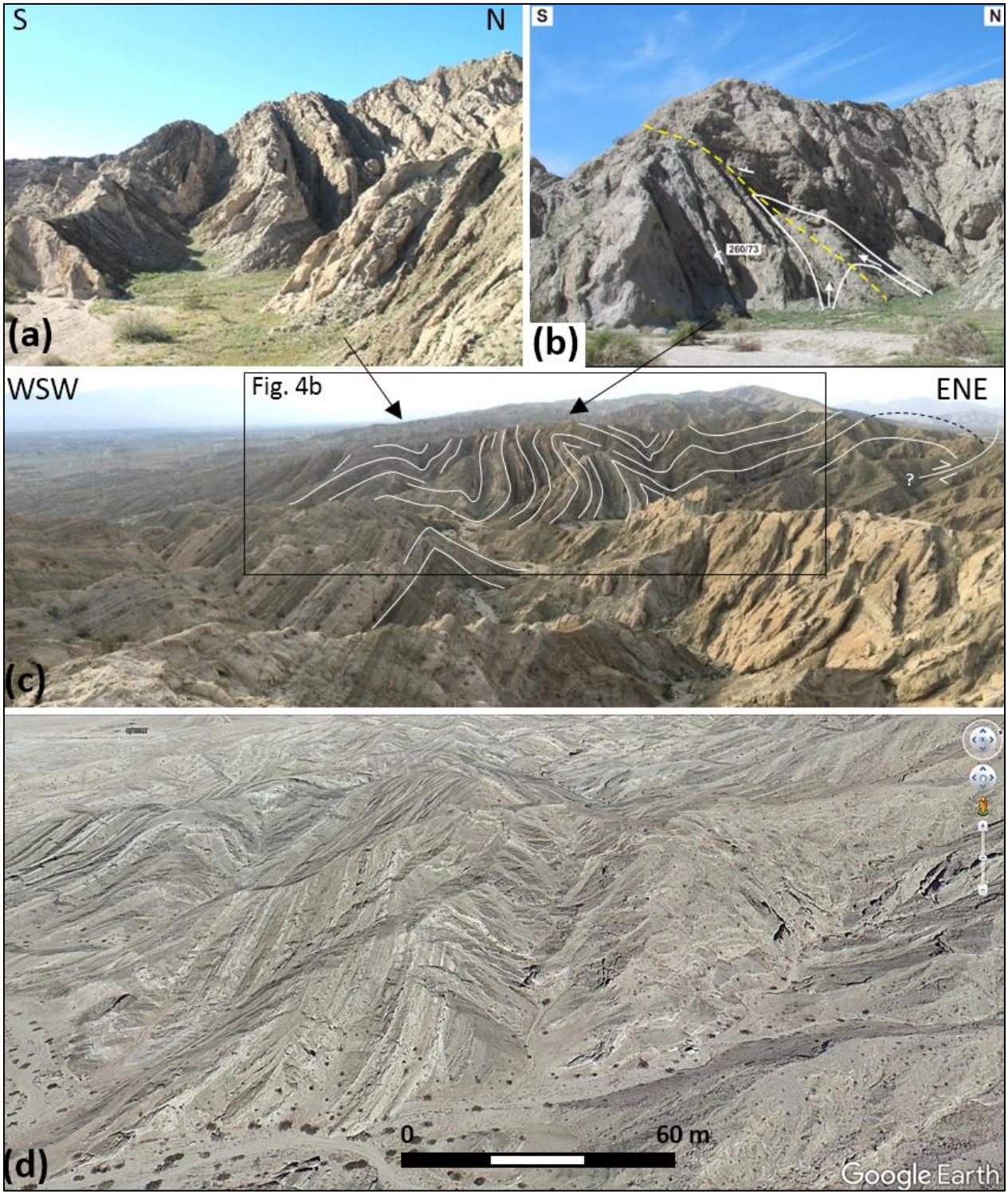

(a)
N
0
300 m
Google Earth
(b)
N
0
300 m
Google Earth


**S2: Uninterpreted Fig. 3a–c. See Fig. 2 for location. © Google Earth 2011.**



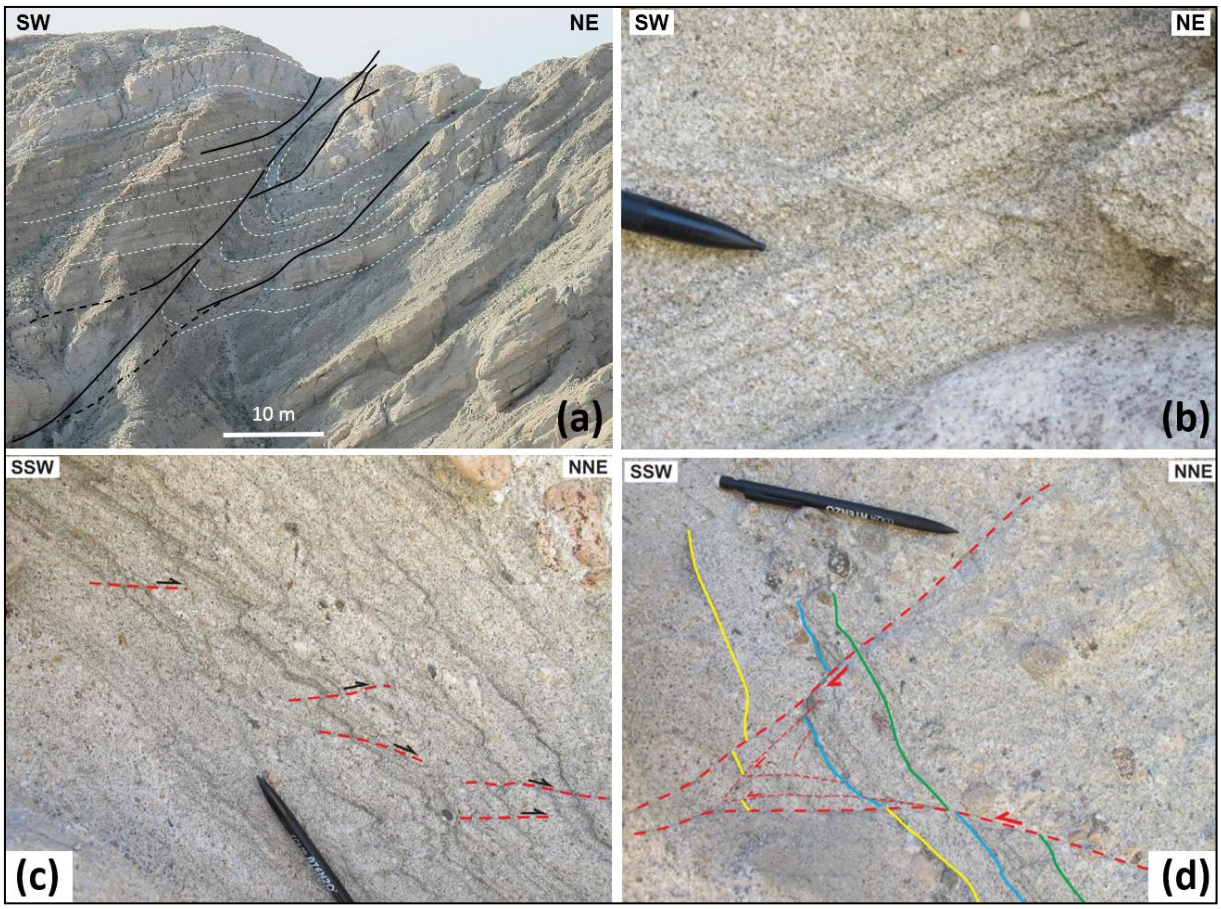

**S3: Examples of subsidiary fold styles in the northwestern macro-fold. For location, see fig. 3a. (a) DEM image showing an upright and west-plunging anticline-syncline pair. © Google Earth 2011. (b) Symmetric and concentric anticline, same as in (a) viewed to the east. (c)**

**Kink-style syncline changed along strike southeastward from symmetric in (a). (d) Tight to isoclinal, steeply west-plunging anticline in the northern part of the macro-fold. Note folded quartz-rich sandstone layer used as stratigraphic marker in the upper Palm Spring Formation. (e) Same quartz-sandstone layer as in (d) repeated by tight/isoclinal folding.**

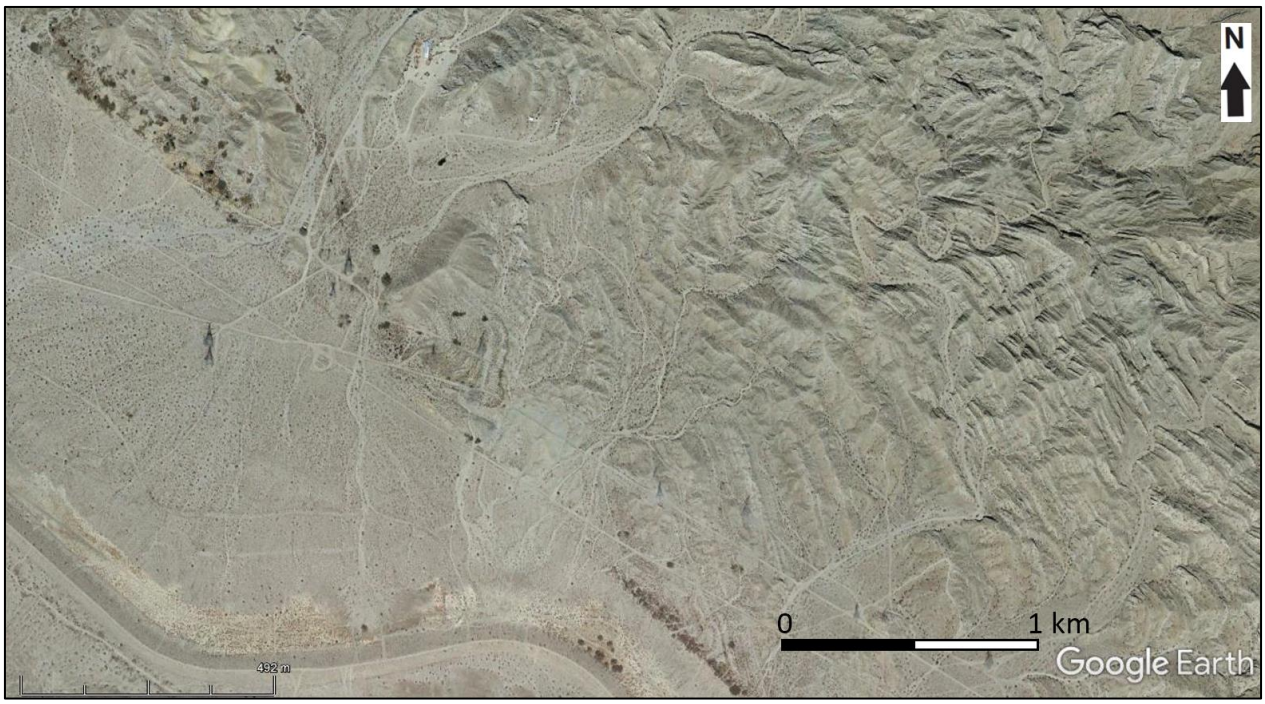



**S4: Examples of macro- and meso-scale fold styles in the central macro-fold (location in fig. 3b). (a) Open to slightly asymmetric syncline fold hinge plunging moderately west. (b) Outcrop of the fold hinge of the central macro-fold. The hinge zone is relatively tight, and the fold partly overturned to the SW. Note how the mudstone bed (white lines) thickens into**

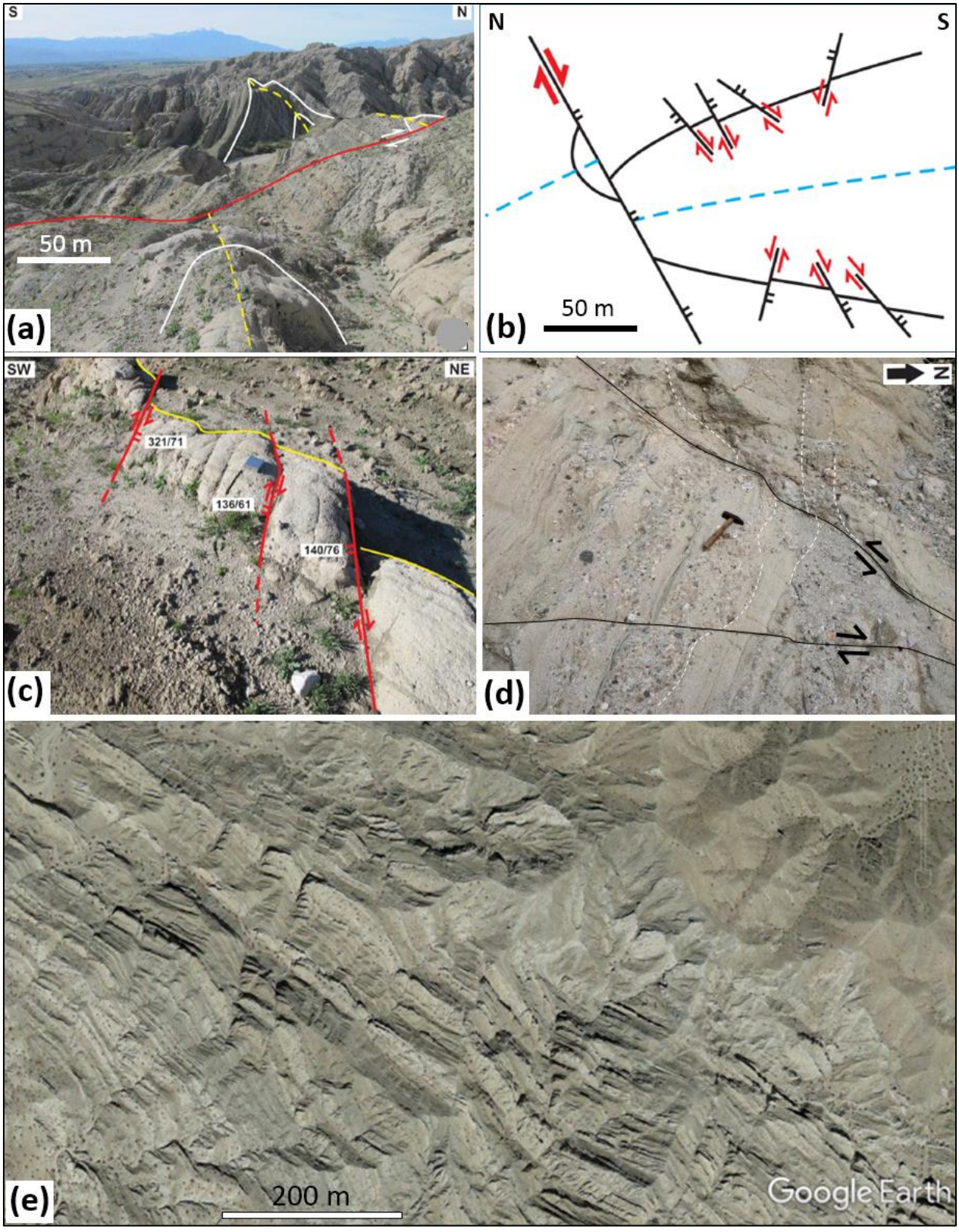
**the fold hinge. Dashed yellow line represents the fold axial surface. (c) Panorama view of the central macro-fold, showing change in geometry and tightness of subsidiary anticline-syncline pairs toward northeast. Note presence of the major SAFZ-parallel, open anticline in the northeast, and the location of Indio Hills fault. (d) DEM image of the same outline as in (c). © Google Earth 2011.**




**S5: (a) Cliff view of a reverse/thrust fault system (black lines) in upper Palm Spring Formation strata that truncates and offset bedding surfaces (white stippled lines). Note the presence of fault-related drag folds that reveal top-NE (right) sense of shear. See fig. 3c for location. (b) Minor reverse fault in SW-dipping sandstone bed. Note fault movement top-SW. Location is shown in fig. 3c. (c) Outcrop photograph viewed in section on NNE-dipping sandstone beds, comprising E–W-trending, north-verging minor, asymmetric folds and faults. Note that the low-angle minor faults (dashed red lines) formed within the minor fold hinges. Location is shown in fig. 3c. (d) Field photograph on NNE-dipping sandstone layers showing a conjugate set of minor reverse faults (dashed red lines) that offset normally, thin sandstone beds (green, blue and yellow). Location is shown in fig. 3c.**



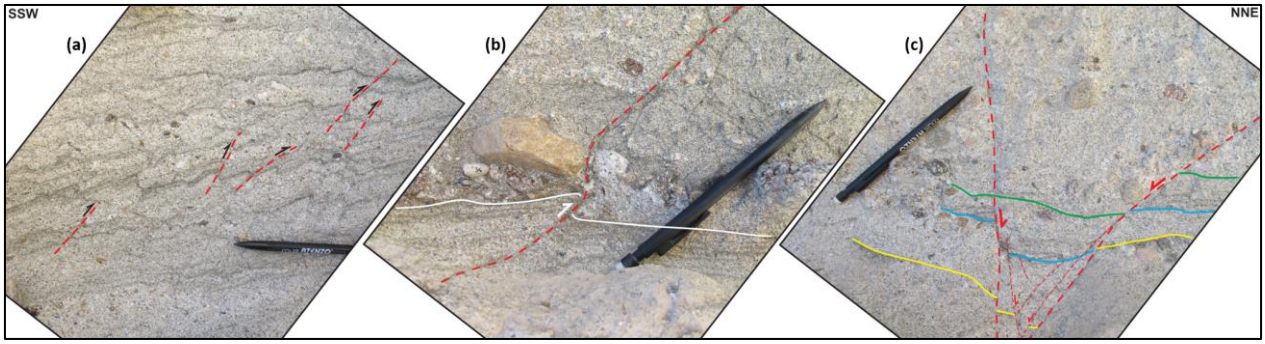

**S6: Uninterpreted Fig. 5. See Fig. 2 for location. © Google Earth 2011.**




**S7: (a) Outcrop photograph showing right-lateral offset (c. 70 m) of the central macro-fold axial surface trace (yellow stippled line) by a steep, NNW–SSE trending, NE-dipping brittle**

**fault (red line). Note partly overturned bedding (white line) in the hinge zone to the west. See fig. 3b for location. (b) Sketch of the steep right-lateral strike-slip fault that decapitates the entire hinge of the central macro-fold. Note also subsidiary NW–SE and NNE-SSW trending, NE-dipping, right- and left-lateral faults, respectively that offsets the macro-fold limbs. See fig. 3b for location. (c) Outcrop photograph of a meter-thick sandstone bed crosscut and offset by minor steep, NW–SE to NNW–SSE trending right-lateral strike-slip fault. See fig. 3b for location. (d) Outcrop in vertical view showing a minor conjugate fault set defined by N-S and NNE-SSE trending right- and left-lateral strike-slip faults. Locality shown in fig. 3c. (e) Satellite image illustrating large scale kink bands arranged as cross faults at high angle to bedding on the southeastern macro-fold. See fig. 2 for location. © Google Earth 2011.**


**S8: Uninterpreted Fig. 6. See Fig. 2 for location. © Google Earth 2011.**




**S9: Field photographs of centimeter-scale faults in the Indio Hills. The photographs were rotated anticlockwise by 52° to better analyze the microstructures they display. Low-angle, bending normal faults in (a) and (b) become similar to micro thrust-faults and planar reverse faults in (c) resemble extensional, graben-bounding fault. Notice the potential thickened wedges of syn-tectonic sediments in the extensional micro-graben in (c) (cf. green, blue and yellow lines). Location is shown in fig. 3c.**