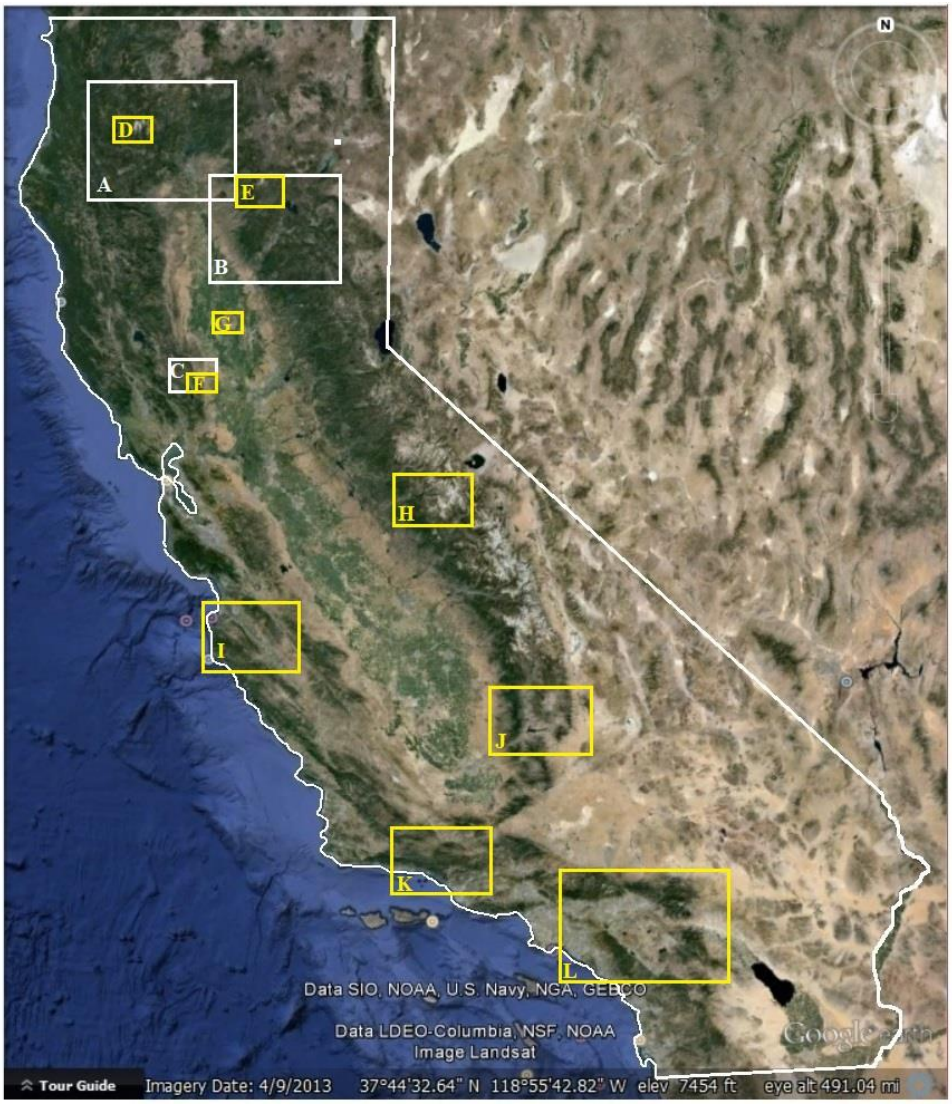
Chapter 7: Extended CGRS throughout California

Abstract

Eight directions of small circle lineament trends are traced in twelve locations (three in Chapter 6 and 9 here) in the surface topography of California. They are shown to be consistently visible at various altitudes and terranes and extend the entire length of the state. They are not directly related to direction of accretion or mapped faults, and do conform in location and shape to Concentric Global Ring Structures (CGRS) through which they are traced back to a shear center and are directly related to the geomorphology.

Introduction

This Photo Essay provides images the length of California to show the set of eight lineaments identified in Chapter 6 are a common, but not exhaustive phenomena across the state. The author also started as a doubter. The linears were too abundant and had to be purely imagination or something insignificant. It was by panning up and down, seeing the trends closer and further away, that was convincing of their reality and significance. Understanding these trends and the combining of their energy expressed in the topography can explain much of the landscape's geomorphology.



While this short essay was created to provide visual proof of the linears pervasive occurrence, nothing can substitute for the reader investigating through Google Earth for themselves. If we want to understand the energy that shaped our planet's mountain ranges and river, made mineral deposits available, and causes destructive earthquakes, we need to recognize and understand linears and their origin in astral-impacts.

Figure 7.1: Google Earth image of California, showing the locations and relative size of locations A-C discussed in Chapter 6 and additional locations discussed in this chapter. They are: D) Thompson and Little Granite Peaks, E) Mount Lassen detail, F) Rumsey detail, G) Sutter Buttes, H) Yosemite Region, I) Monterey east, J) Sierra's south end, K) Santa Barbara, and L) Orange and Riverside Counties.

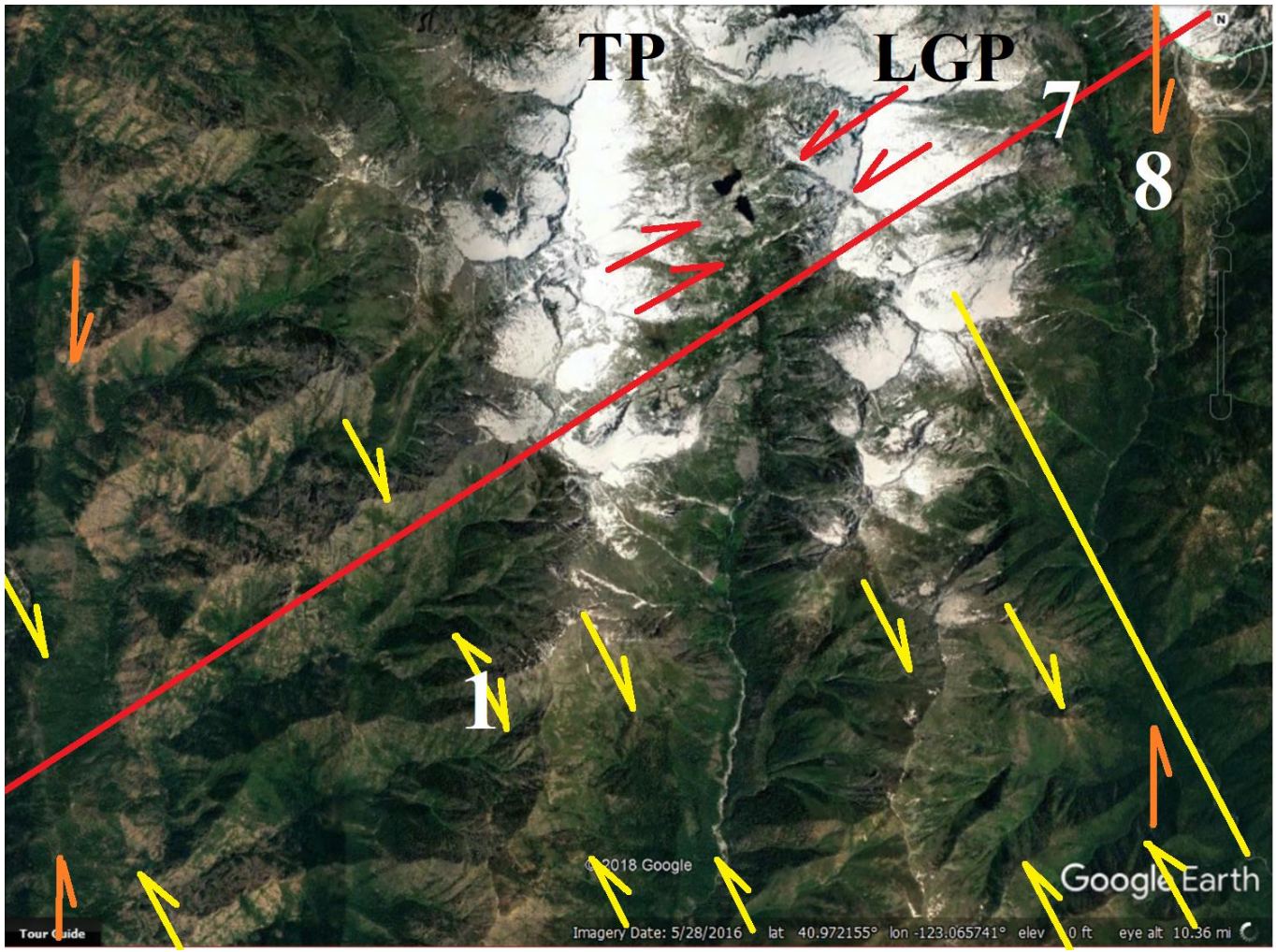


Figure 7.2: Google Earth image of Thompson and Little Granite Peaks, same as Figure 6.1, showing how obvious many linears are at higher resolution.

Thompson and Little Granite Peaks

This area is a detail out of the Redding and the northern end of the Central Valley, Figure 6.3. Not only are the linears obvious at this resolution, but can be seen at all resolutions.

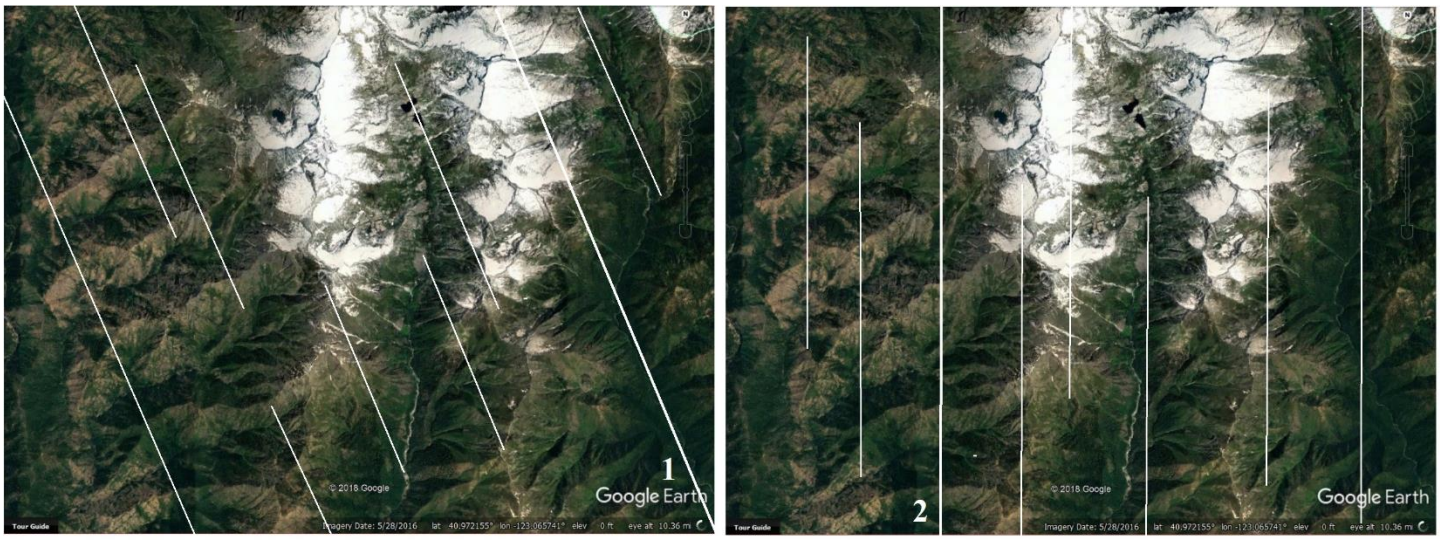


Figure 7.3: Google Earth image of Thompson and Little Granite Peaks in the Klamath Mountains, a detail of Redding, California, Figure 6.3 while extending view of Figure 6.1. Location D in Figure 7.1.
Image 7.3.1: Some of the linears concentric to trend 1. Image 7.3.2: Some of the linears concentric to trend 2. Image 7.3.3: Some of the linears concentric to trend 3. Image 7.3.4: Some of the linears concentric to trend 4. Image 7.3.5: Some of the linears concentric to trend 5. Image 7.3.6: Some of the linears concentric to trend 6. Image 7.3.7: Some of the linears concentric to trend 7. Image 7.3.8: Some of the linears concentric to trend 8.

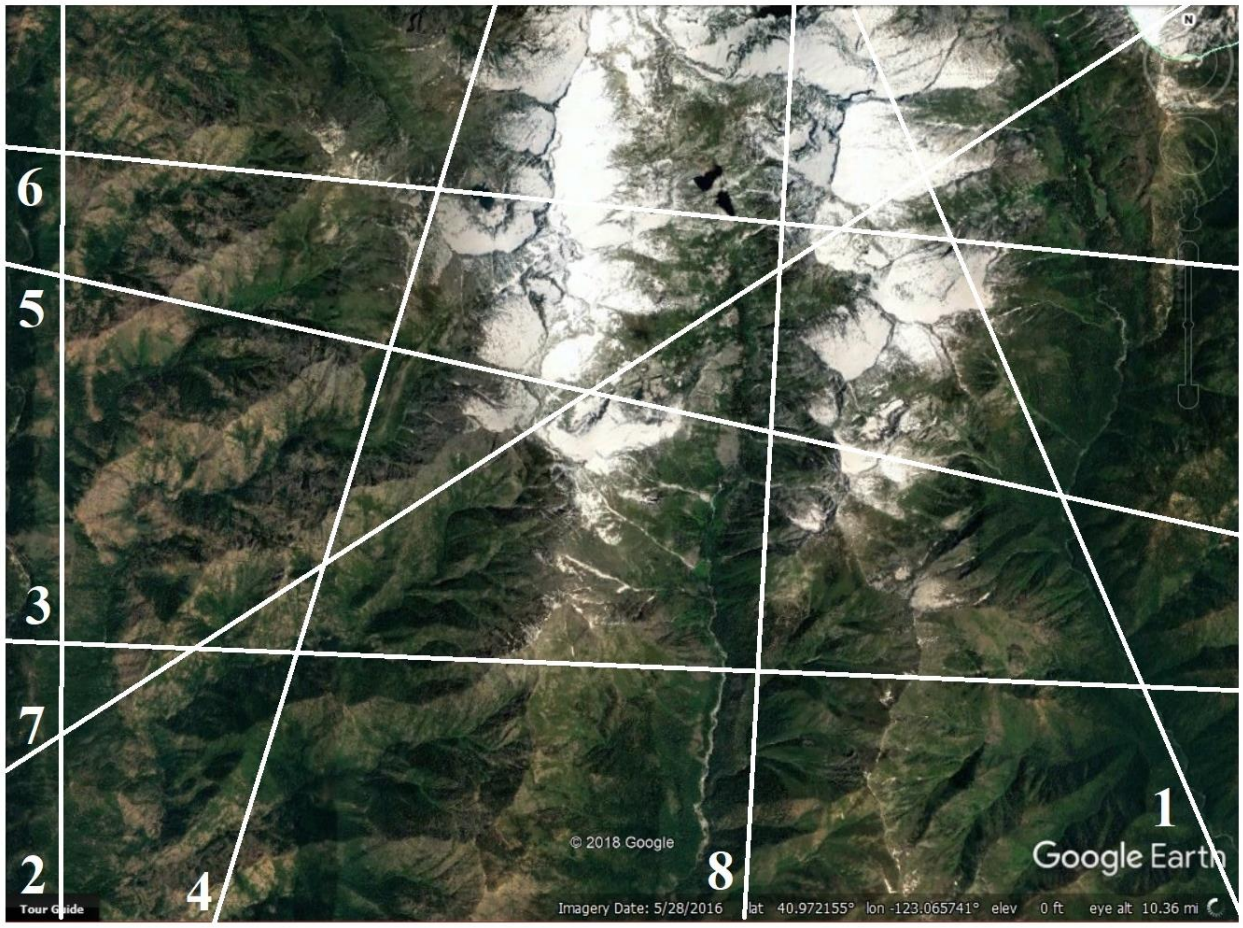


Figure 7.4. Thompson and Little Granite Peaks showing the direction of all 8 lineament trends.

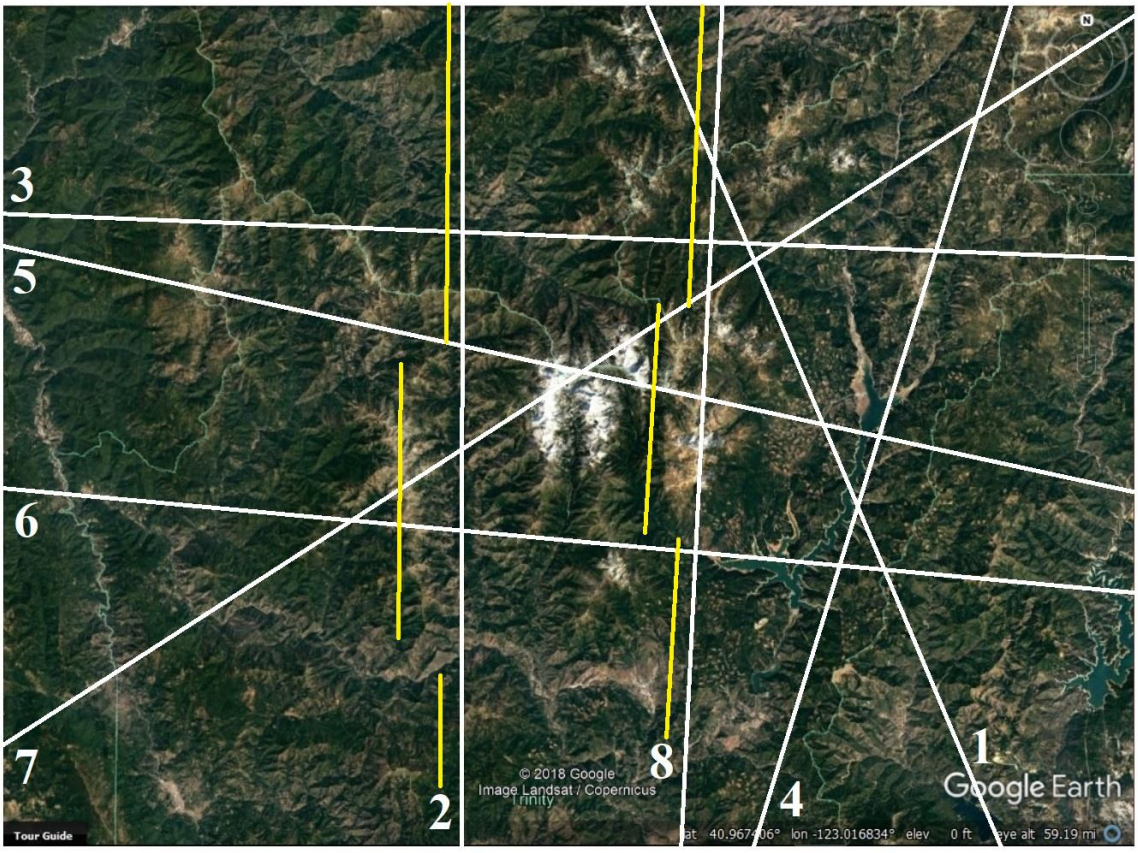


Figure 7.5: Thompson and Little Granite Peaks showing all 8 lineaments in a zoomed out view. Zooming in and out is a powerful tool for seeing linears and peculiarities of their form. The lateral displacement shown in yellow may be real and affects other linears, or is just an illusion of this view. More study is needed.

The actual linear trends are a reality viewed at any resolution.

Mount Lassen detail

This is a detail from Figure 6.9, Mount Lassen and the southern end of the Cascade Range. One set of mountains may stop and another start, but the CGRS just continue across the division. This causes us to question which explanation is real and adheres to the evidence, and which is a just-so story ready to be revised?

Figure 7.6: Google Earth image of Mount Lassen, California, a detail of Figure 6.9. Location corresponds with E in Figure 7.1. Images 7.6.1- 7.6.8 explanations consistent with Figure 7.3. (Accessed 12/20/2015.)

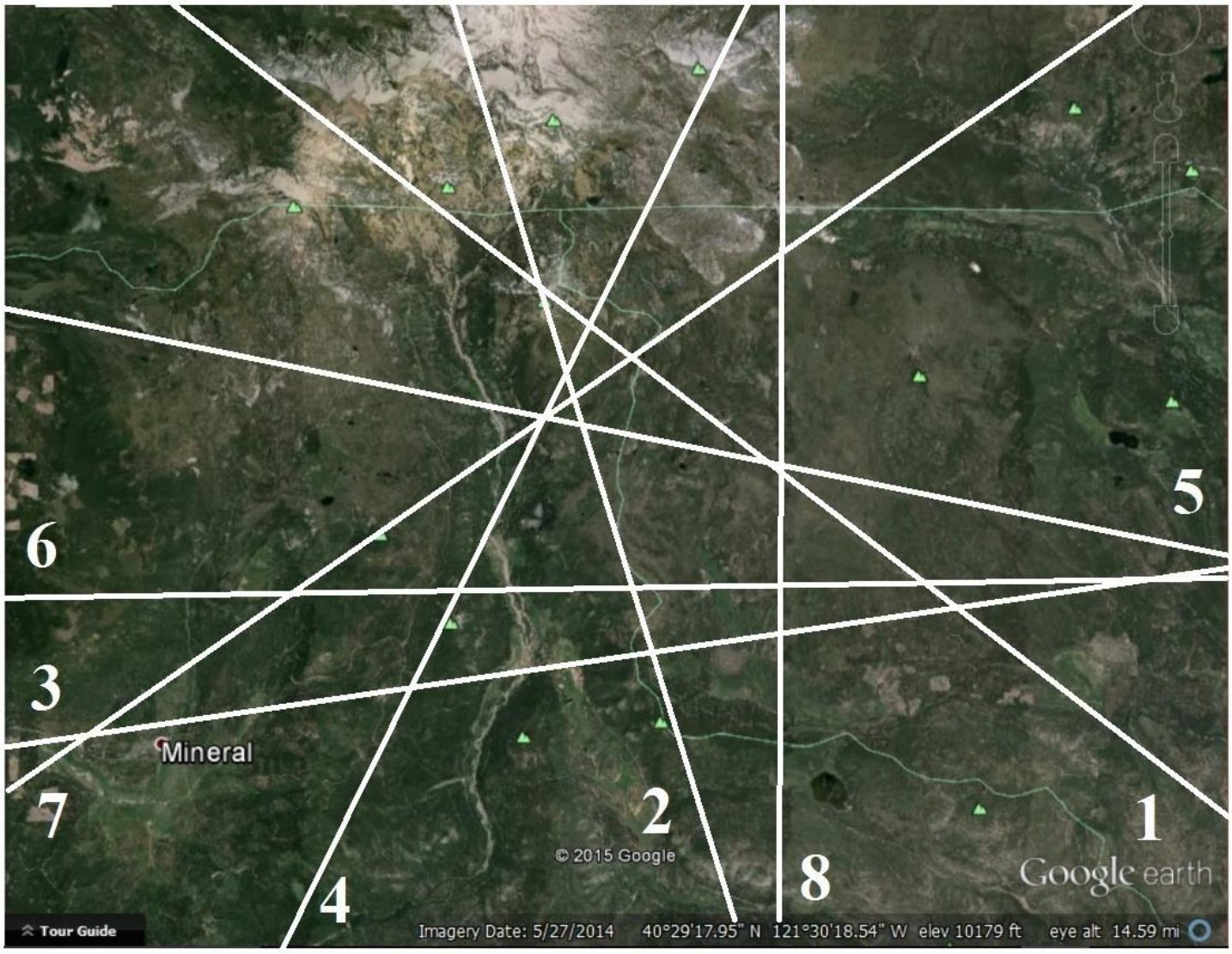


Figure 7.7. Mount Lassen detail showing direction of all 8 lineament trends.

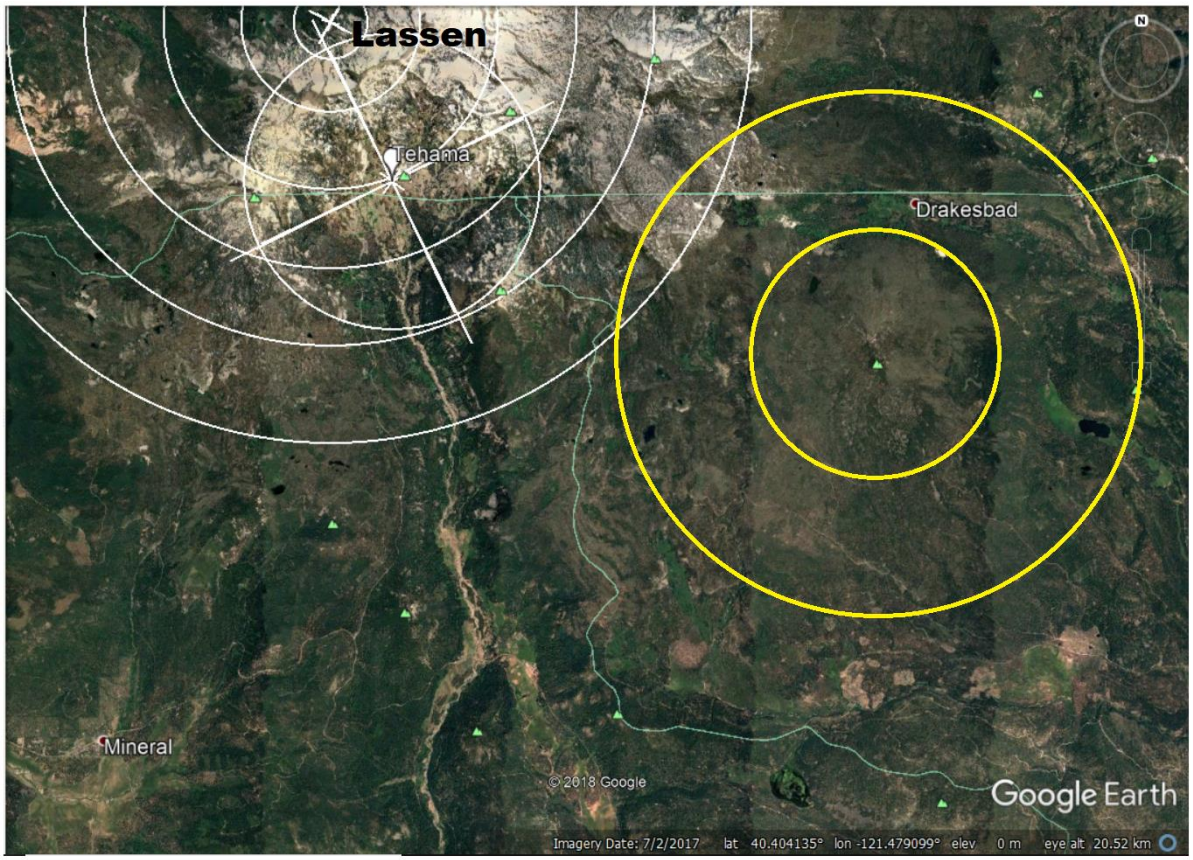


Figure 7.8. More recent Google Earth image of same area. (Note the 2017 date at the bottom.) Greater detail and different time of the year gives a slight difference of linear visibility. Six concentric circles mapped centering on Lassen Volcano, and one circle with a large "x" through it locates the center of extinct Tehama Volcano which blew its top in the deep past. Small remnants of Tehama still ring the area of the circle. These are volcanic circles, and may not represent impacts but ring faults from magma pushing its way to the surface.

Pair of concentric yellow circles are considered to be impact related. The mountain near the center of yellow circle is interpreted as a remnant of the central uplift, but not much more is visible to distinguish impact circles from circles of volcanic origin. Much more investigation is needed on this topic. (Accessed 8/28/2018.)

Rumsey detail

When circular lineaments prominently occur intermixed with straight lineaments, it is visually more challenging to be certain where one begins and one ends. Understanding the interaction in terms of sequence may help. But, for now, we need to realize both exist, having each of their origins in the same impact events.

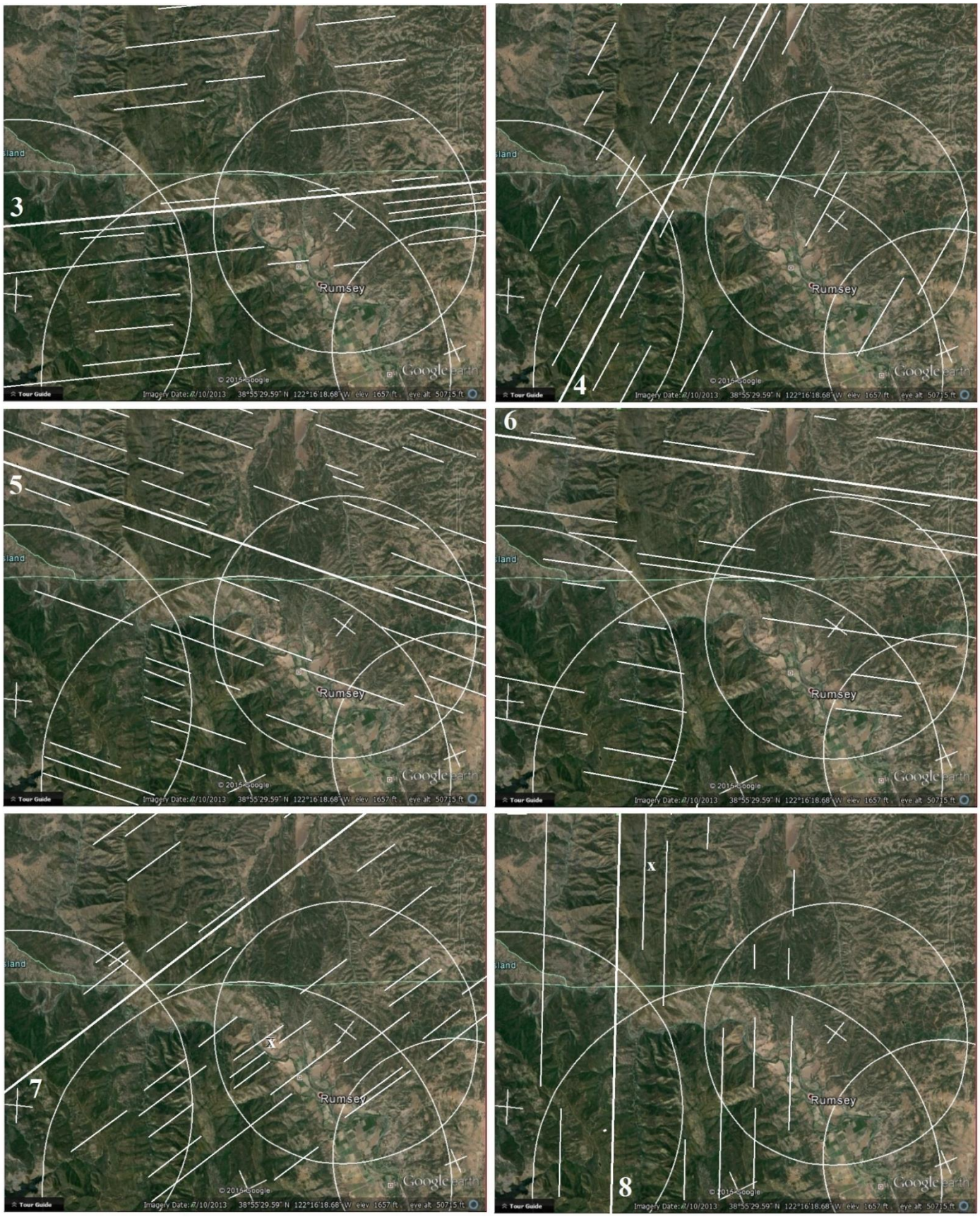


Figure 7.9. Google Earth image of Rumsey, California, a detail of Williams, California, Figure 6.12. Location corresponds with F in Figure 7.1. Images 7.8.1- 7.8.8 explanations consistent with Figure 7.3. The occurrence of concentric linears to the 8 trends was less confusing when circular lineaments were identified and recognized that few of the straight linears actually crossed circles.

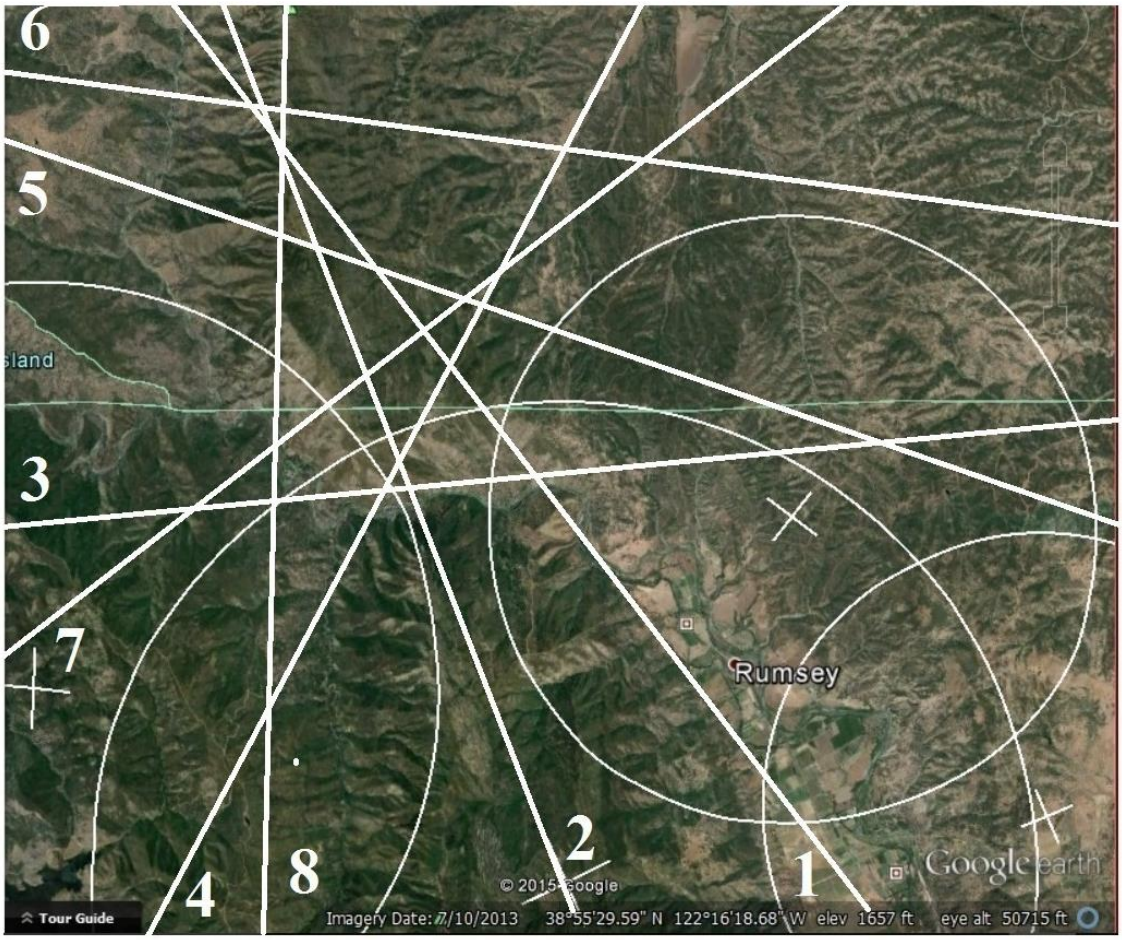


Figure 7.10. Rumsey detail showing direction of all 8 lineament trends.

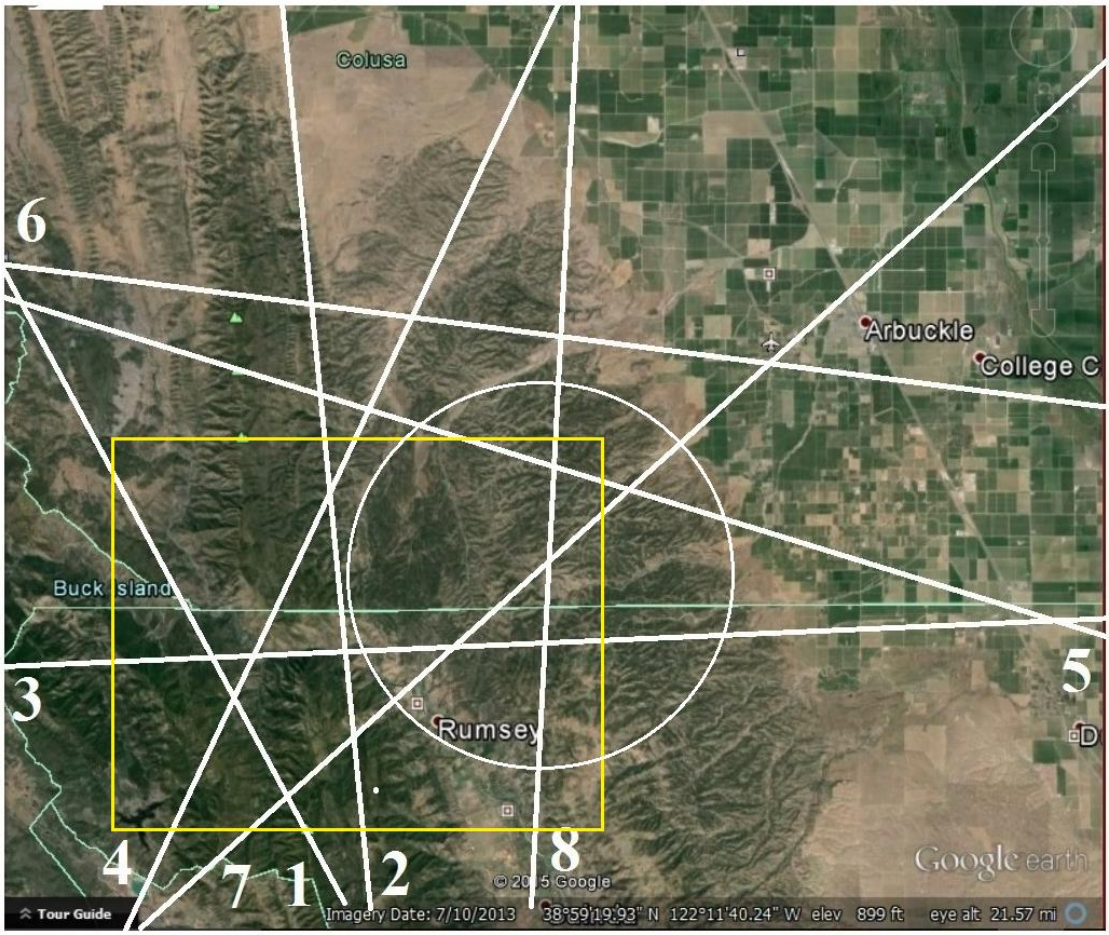


Figure 7.11. "Williams" showing the area of Rumsey detail in yellow. Recognize that trends are the same at different resolutions, although different linears are the most obvious. White circle is circular lineament shown on Terrane map of Williams, Figure 6.14.

Sutter Buttes

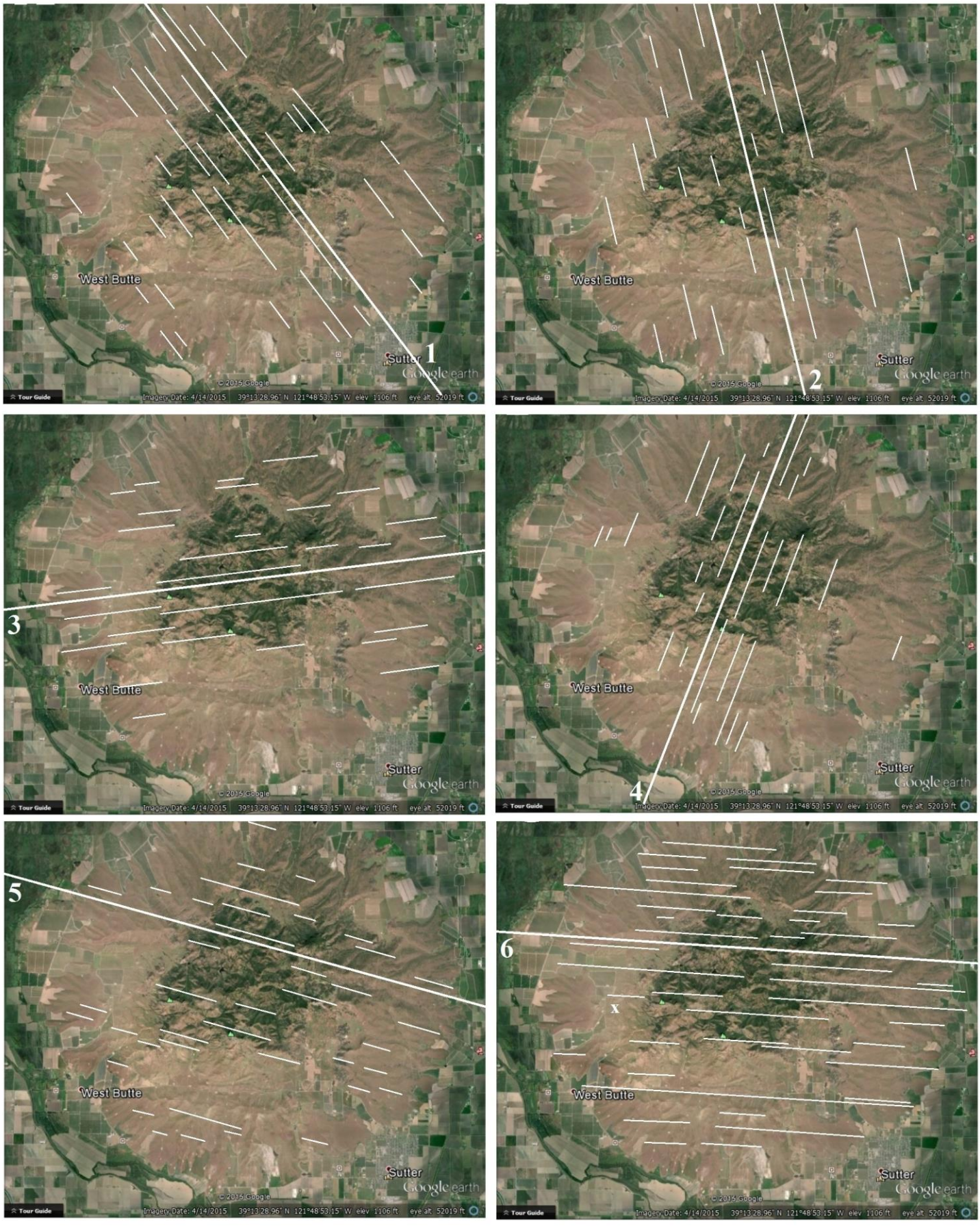


Figure 7.12: Google Earth image of Sutter Buttes, California. Location corresponds with G in Figure 7.1. Image 7.11.1- 7.11.8 explanations consistent with Figure 7.3. (Accessed 12/20/2015.)

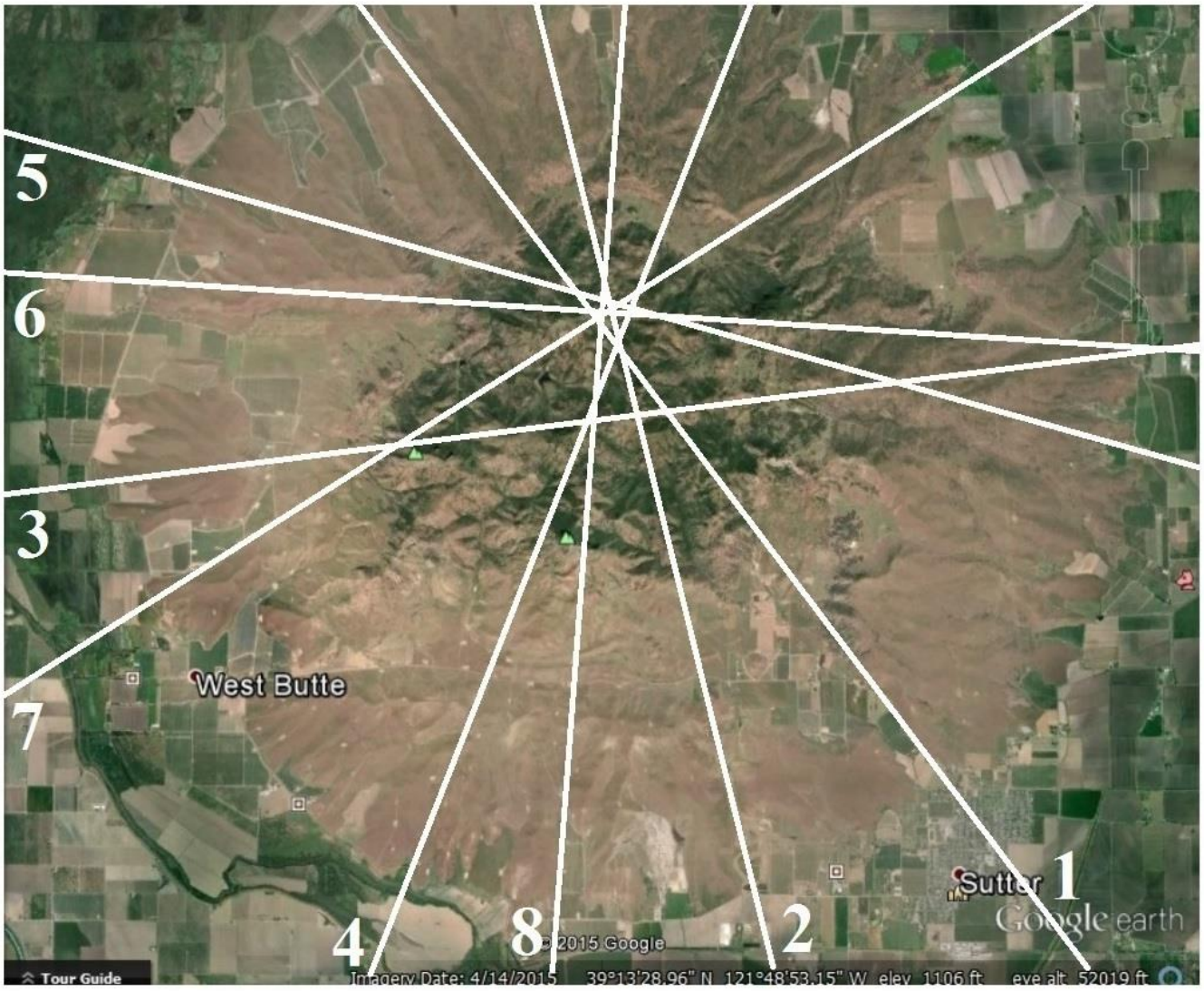


Figure 7.13: Sutter Buttes showing direction of all 8 lineament trends.

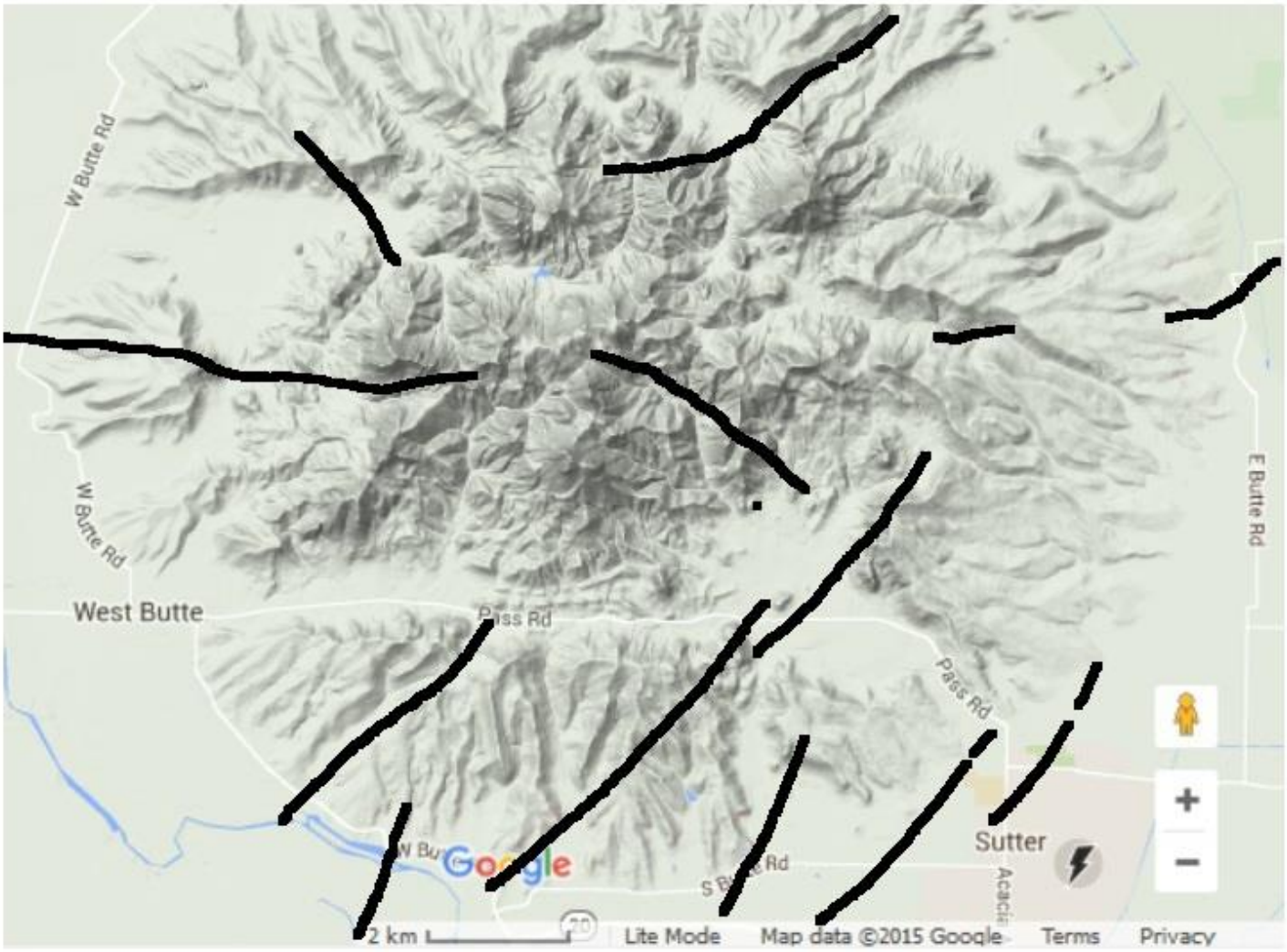


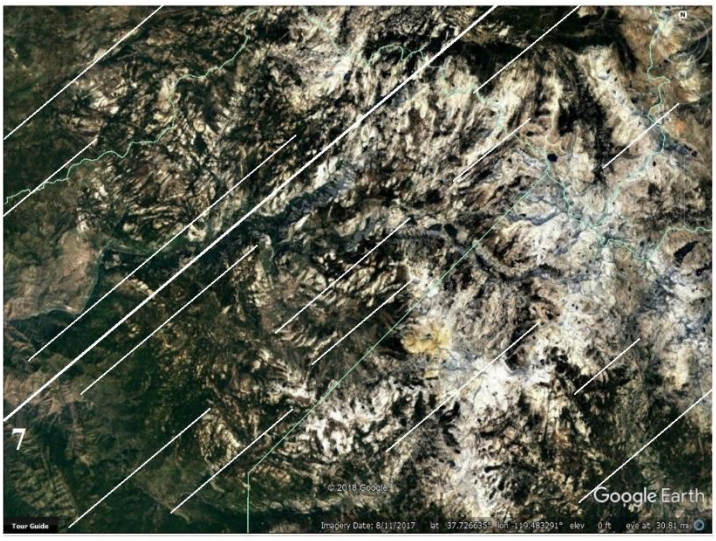
Figure 7.14: Google Earth Terrain map of same area as Figure 7.12 showing the major faults and fault trends. (2015. Accessed 12/20/2015.) Faults after Gutierrez et al. 2010.

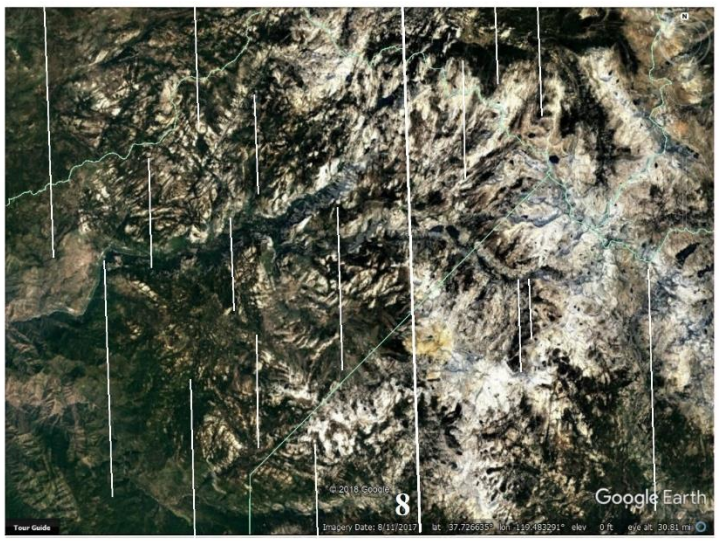
Described as an extinct volcano in the midst of the level, sedimentary-filled Central Valley, Sutter Buttes provides very little evidence that there was significant flows of lava out of any of its many vents. Instead many rather circular vents are plugged with a viscous extrusion of mafic andesite to rhyolite. Many of the plugs ring a large central andesite dome, the rising of which is assumed to predate the smaller plugged vents and produced the slopping sedimentary layers of the skirting rampart beds. The small basin formed by the encircling plugged vents was originally filled with cross-strata of the Kione Formation, which is said by some geologist to resemble a delta deposit and storm deposited sandstone-interbeds. A few oyster shell fragments and lithology identify the Kione Formation that filled the buttes original central valley with deep highly acidic lake deposits (Hausback et al 2011).

Yosemite Region

The rise of the Sierra Nevada Mountains has to be the single biggest energy event in the history of California. Yosemite is right in the middle of them. The just-so story for the valley's formation uses glaciers, long after the mountains had formed, to carve a path through it. Looking at the surface of the granite in Figure 7.14, the layers follow the upward curve of the valley's walls. This is more in keeping with a release wave carving the valley from the bottom up as the granite was growing, not a glacier pushing its way through. Half Dome is covered with thin partial layers called "spalling" produced by its rapid rise while in a soft or molten state. Linears delineating layering and surface granite are seen everywhere. I propose the craters that formed Yosemite arrived *as* these mountains were still moving upwards. Much more study of the granite is needed.

Figure 7.15: View of Half Dome showing concentric rimming layers in the granite. (Image credit, NPS.)





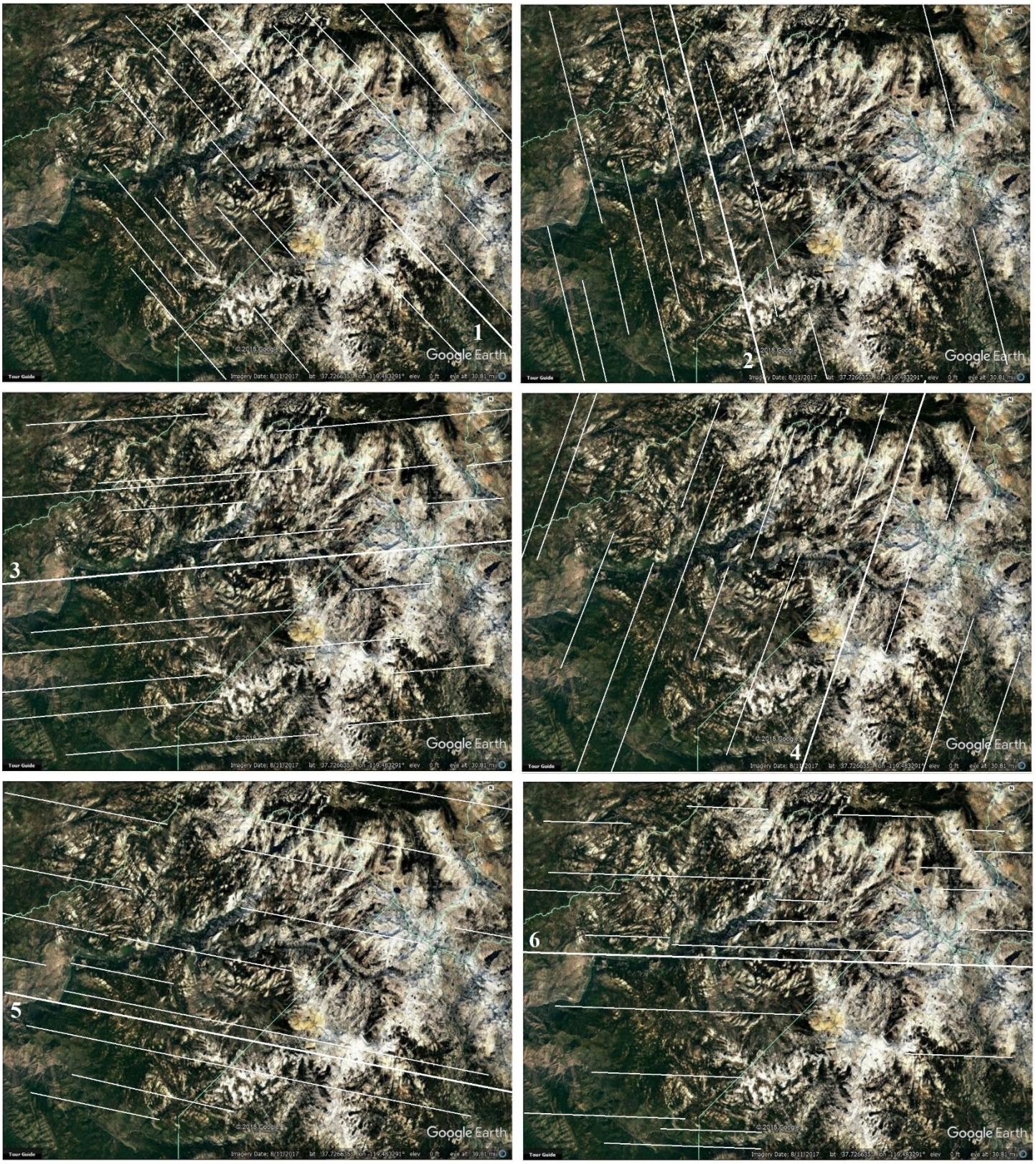


Figure 7.16: Google Earth image of Yosemite, California. Location corresponds with H in Figure 7.1. Images 7.15.1- 7.15.8 explanations consistent with Figure 7.3. (Accessed 4/21/2018.)

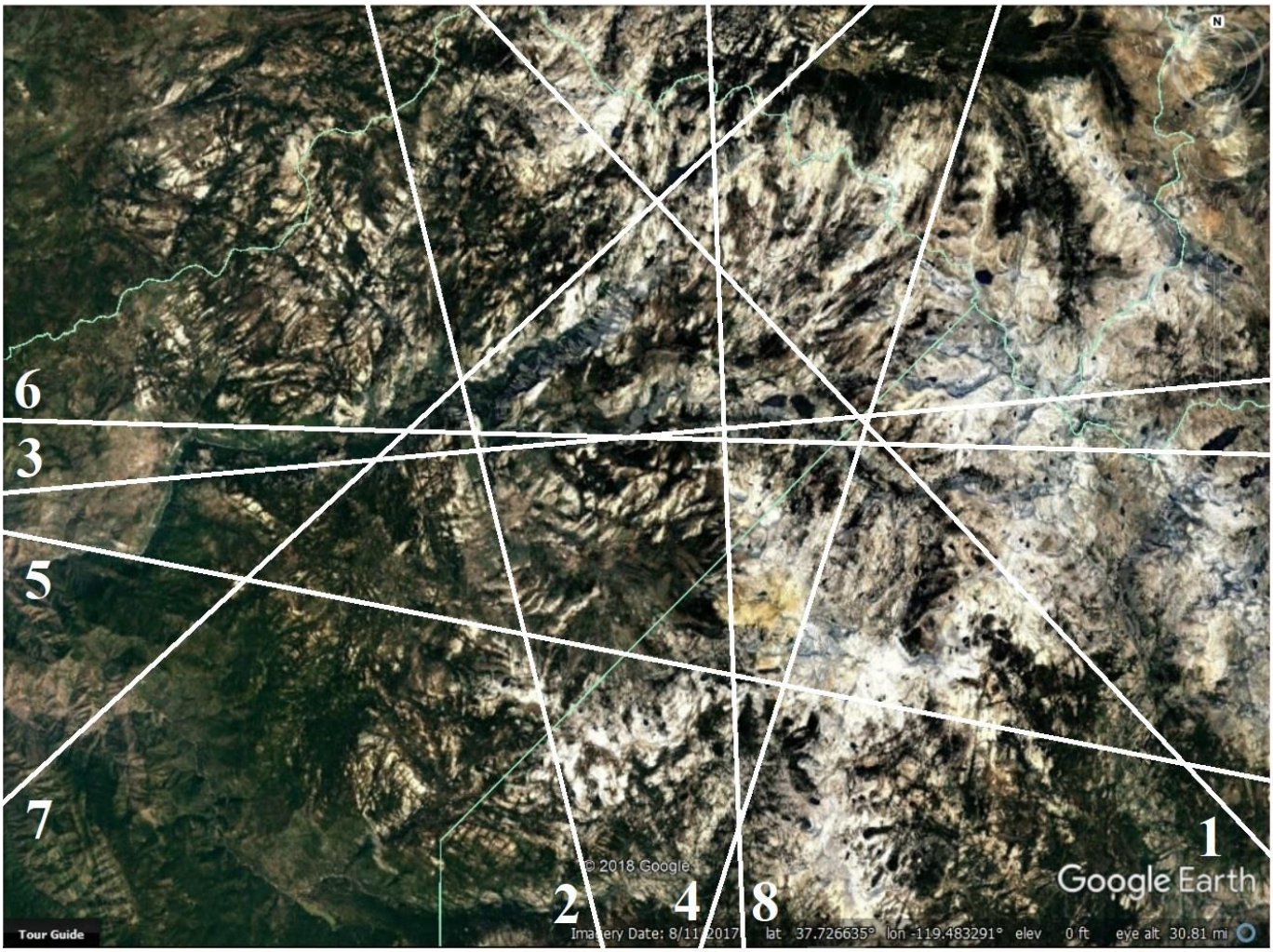


Figure 7.17: Yosemite region showing direction of all 8 lineament trends.

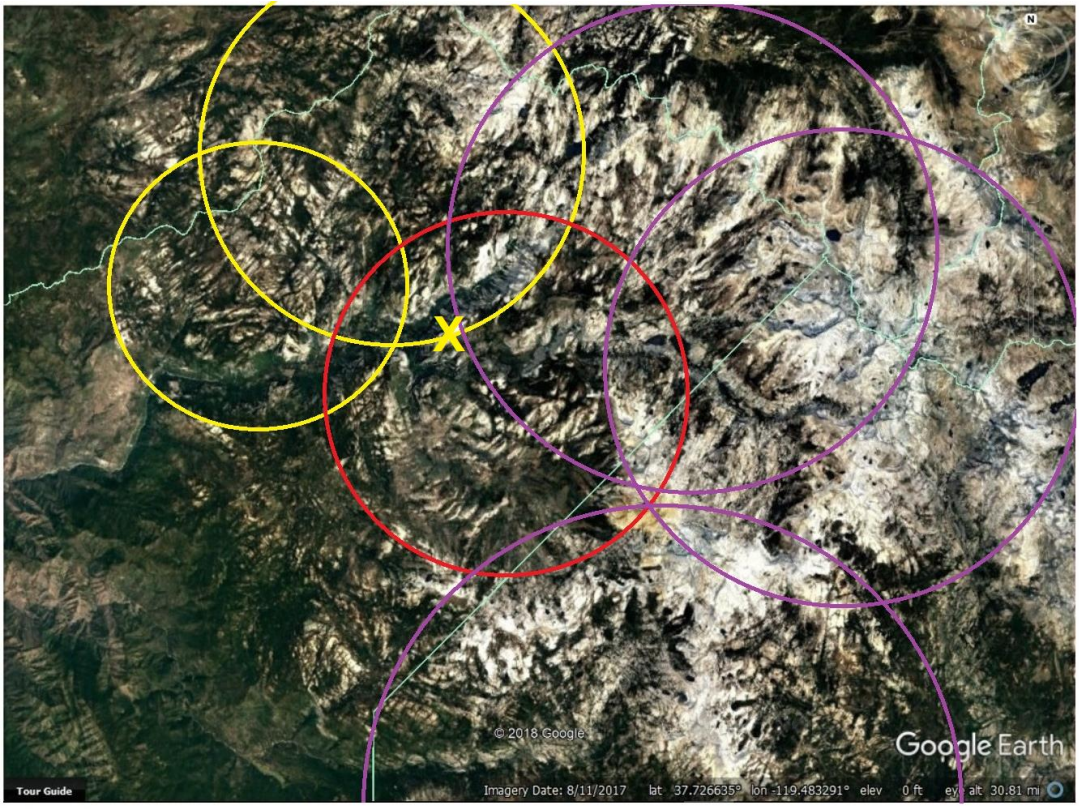


Figure 7.18: Image of Yosemite showing some of the circular lineaments effecting the area. Yellow "X" is location of Half Dome on the south side of Yosemite Valley. Yellow circles are sketches of circular lineaments that defines the valley, Red lineament extends to south, but appears to have an influence in widening the valley. Purple circles are additional lineaments visible in the area, possibly earlier than red and yellow lineaments.

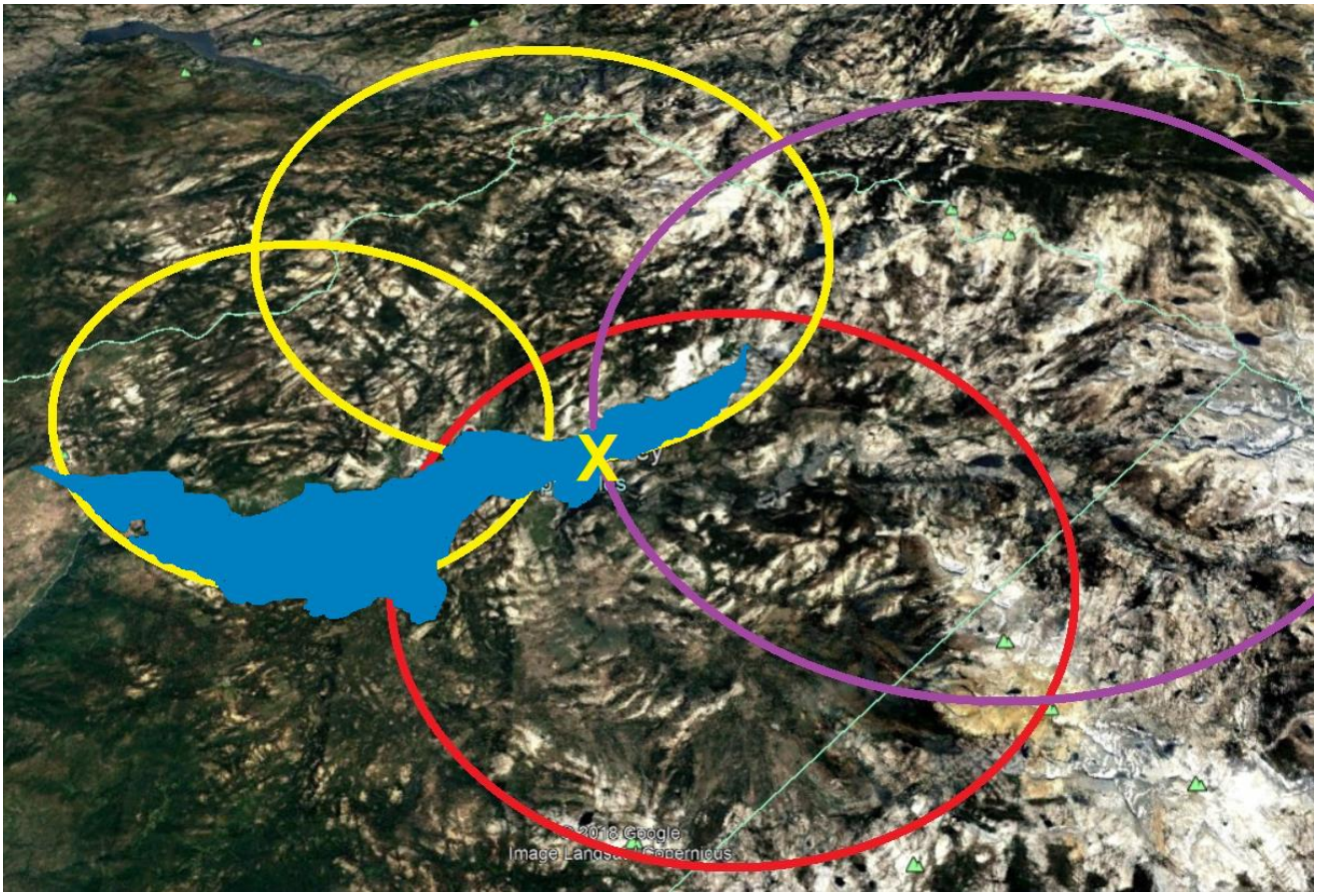


Figure 7.19: Oblique Google Earth image of Yosemite Valley, in blue. Two linear curves forming valley are prominent. Comparing the valley's location back to Figure 7.17 shows the association with the circular lineaments, emphasizing their origin as release-wave valleys.

Monterey

Figure 7.20: Google Earth image of Monterey, California. Location corresponds with I in Figure 7.1. Images 7.19.1- 7.19.8 explanations consistent with Figure 7.3. Although Trend 1 is most prominent, all other trends are highly visible. (Accessed 4/21/2018.)

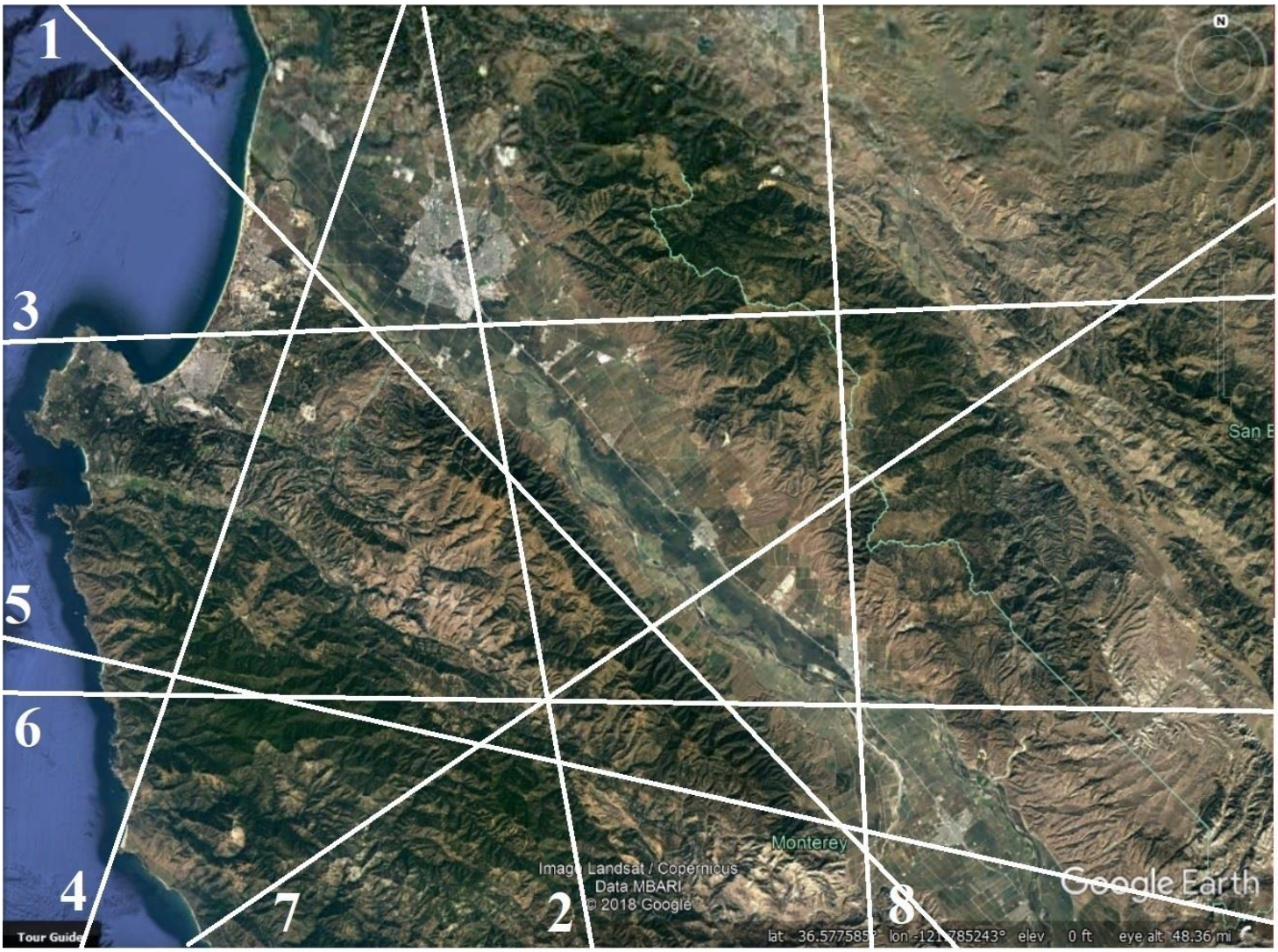


Figure 7.21: Monterey with direction of all 8 lineament trends.

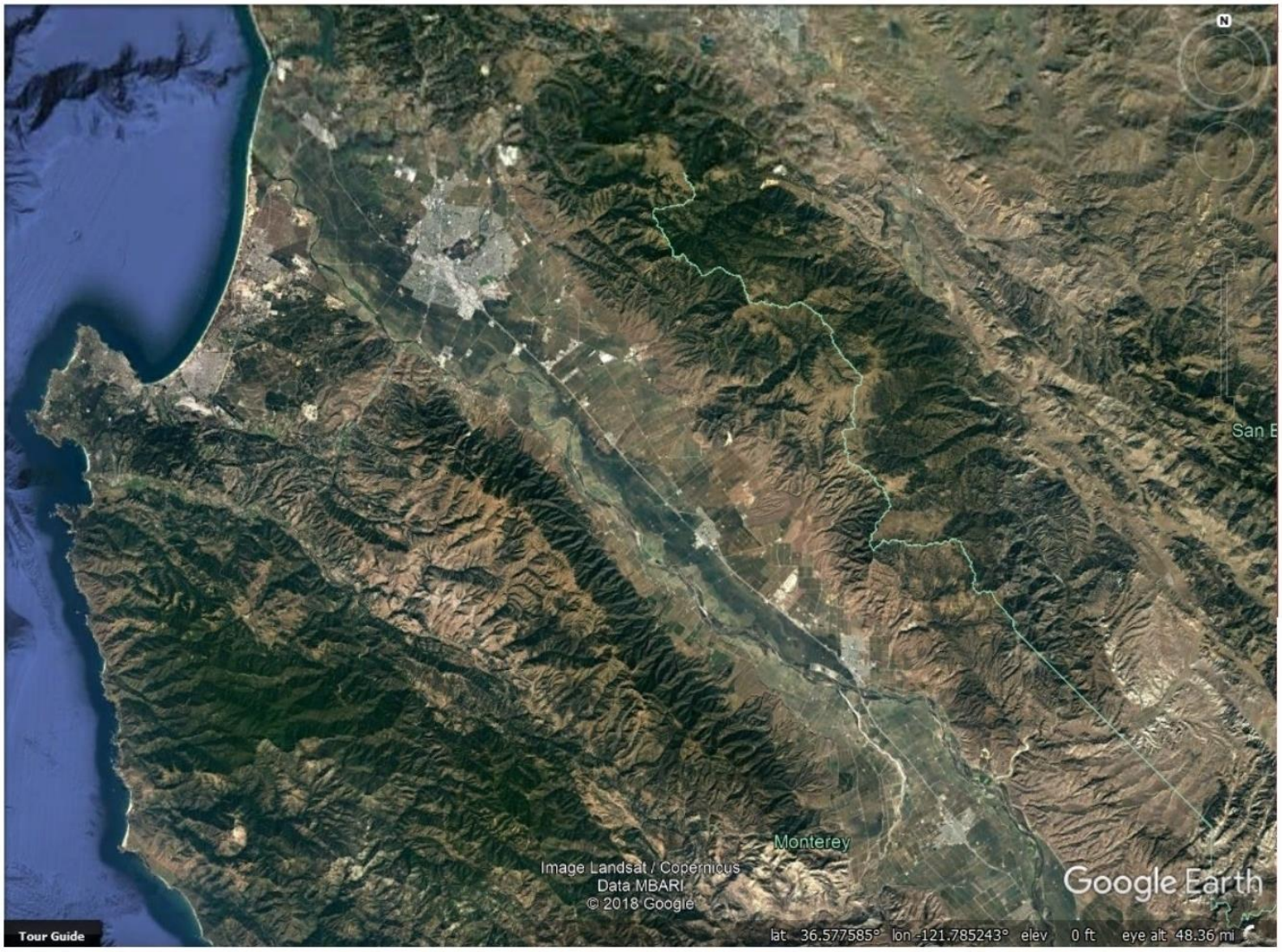


Figure 7.22: Comparing back to the previous map, can you see the topographic clues to those lineaments and circles? Can you see topographic clues to a smaller circle in the center of this larger one? From the darker arc near the bottom, can your eyes connect it with other darker area to form most of the circle?

Figure 7.23: Not all circular lineaments show smaller or larger concentric circles, but many do. I would identify this as an erosional crater, most of which has eroded away. The rings are produced from the shock wave that penetrated further than the impactor into the earth's surface. Alternatively, erosional craters may be from bolides that exploded, never actually having hit the earth, and all that penetrated were their shock waves. This idea needs more research.

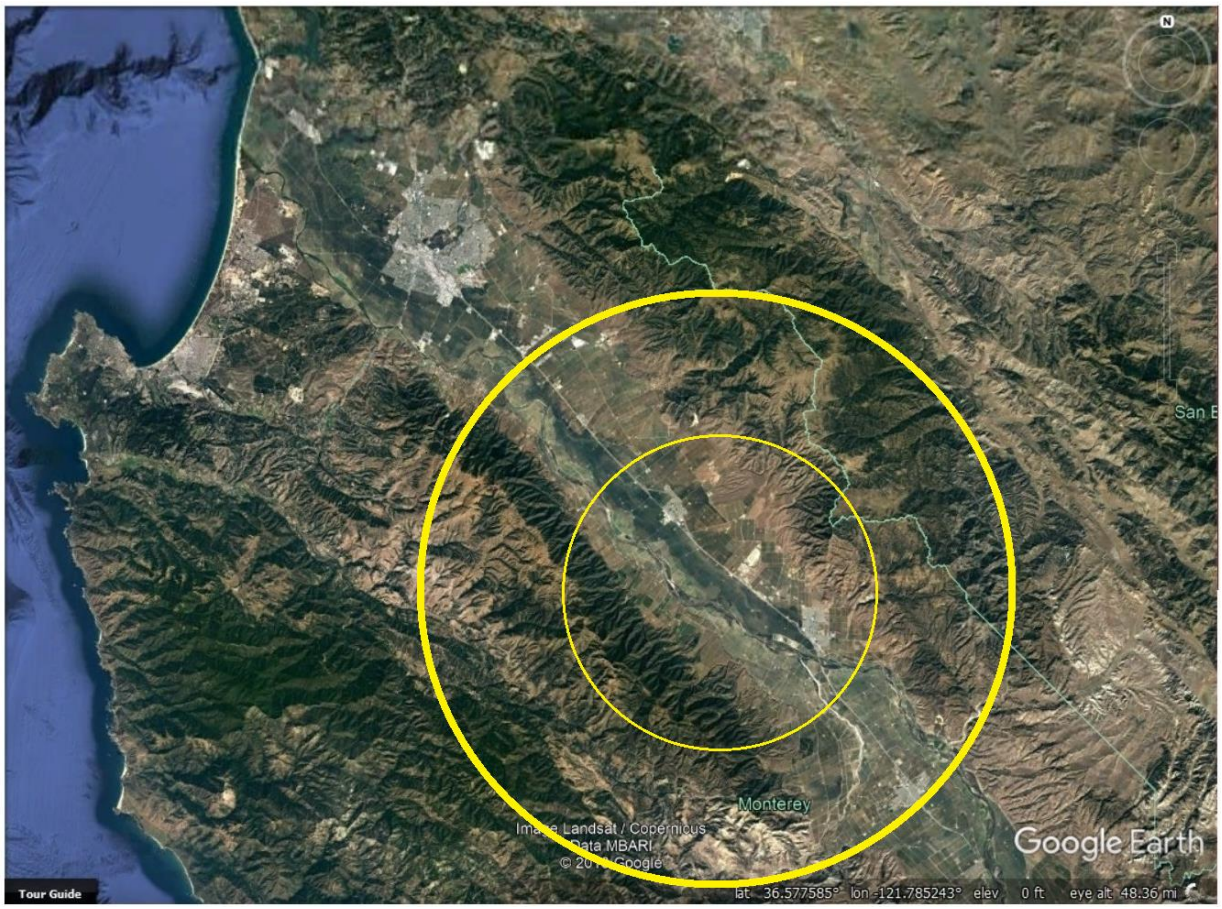


Figure 7.24: This is a second smaller concentric erosional crater. Use the previous maps to recognize topographic clues for it.

Figure 7.25: These are some of the total circular lineaments in this area, visible from this height. Compare figures. Could you find all of them? How many others can you see clues for?

Sierra Nevada Mountains' south end

The Sierra Nevada Mountains probably rose in several motion over several days' time during the Flood. It had several CGRS contributing to the energy signature, with even a crater forming the southern end (Figure 7.37, blue circle). This was all happening at the same time as the Yosemite area was rising. If all of these 8 sets of linears were produced within a few days of each other it is easier to see how each of them could add their unique pattern to the energy load we now find displayed in the topography.

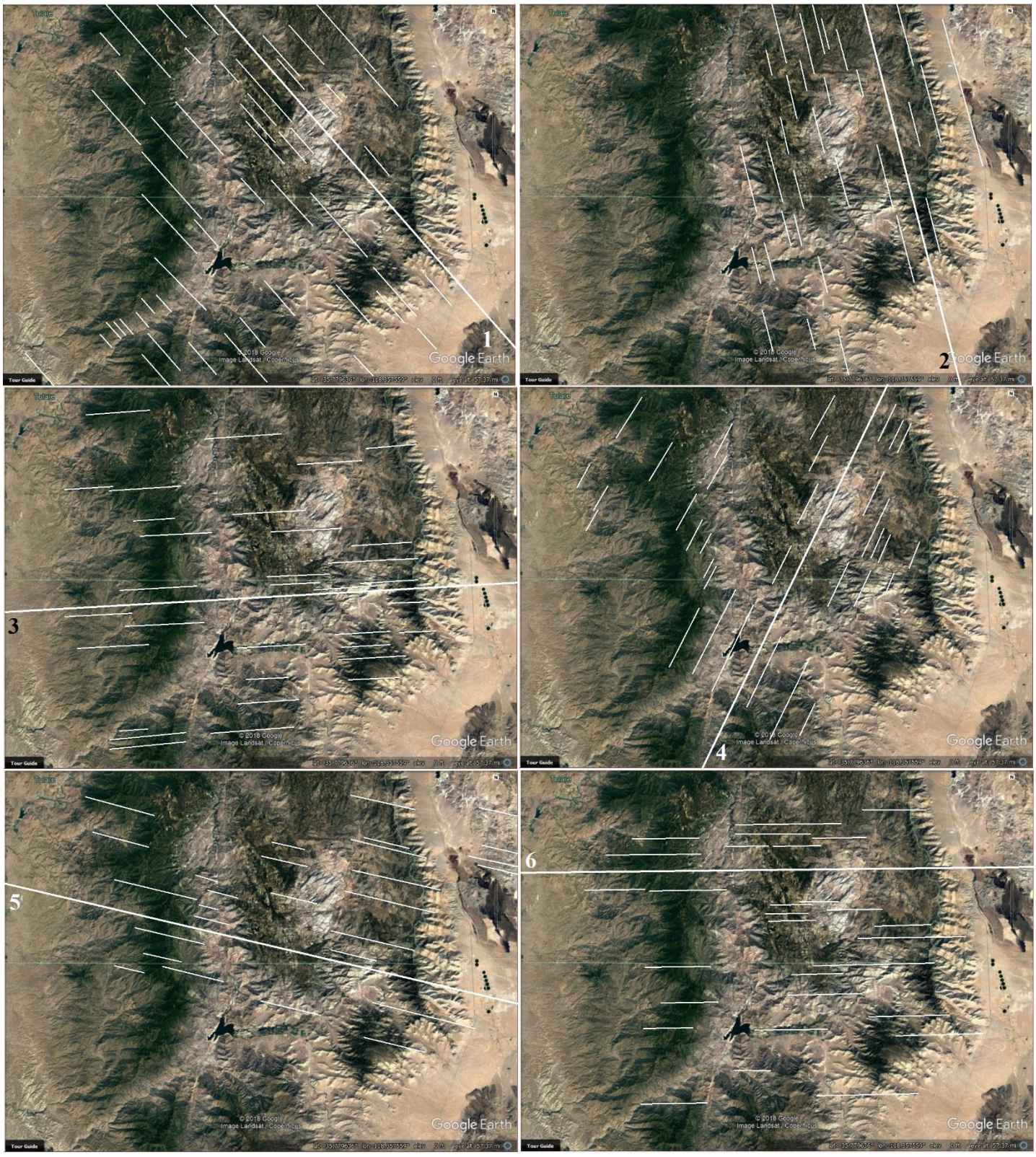


Figure 7.26: Google Earth image of the Sierra Nevada Mountains' south end. Location corresponds with J in Figure 7.1. Images 7.25.1- 7.25.8 explanations consistent with Figure 7.3. Notice that linears are visible in the mountainous area and largely not in alluvium on either side. (Accessed 4/21/2018.)

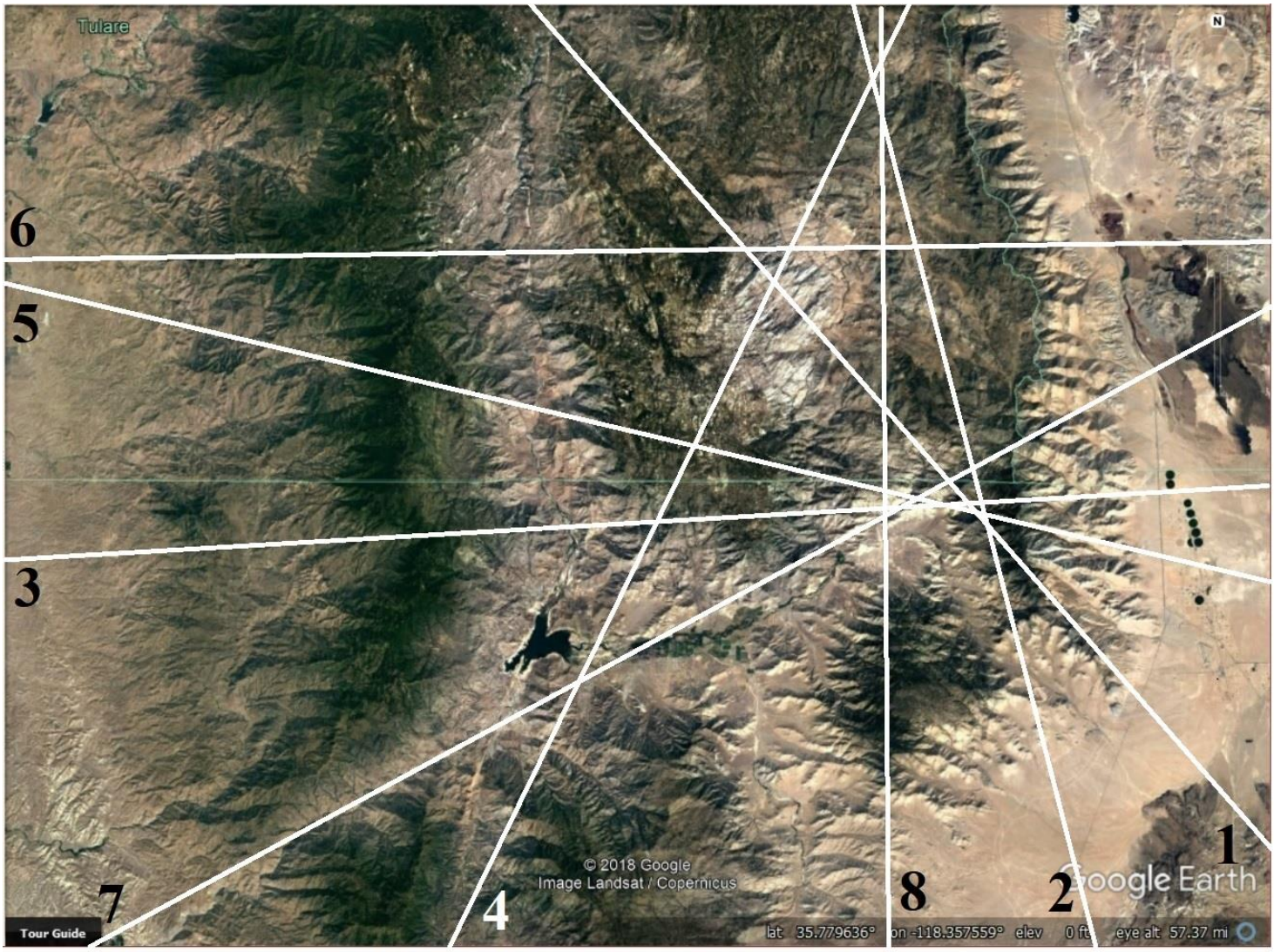


Figure 7.27: Sierra Nevada Mountains' south end showing direction of all 8 lineament trends.

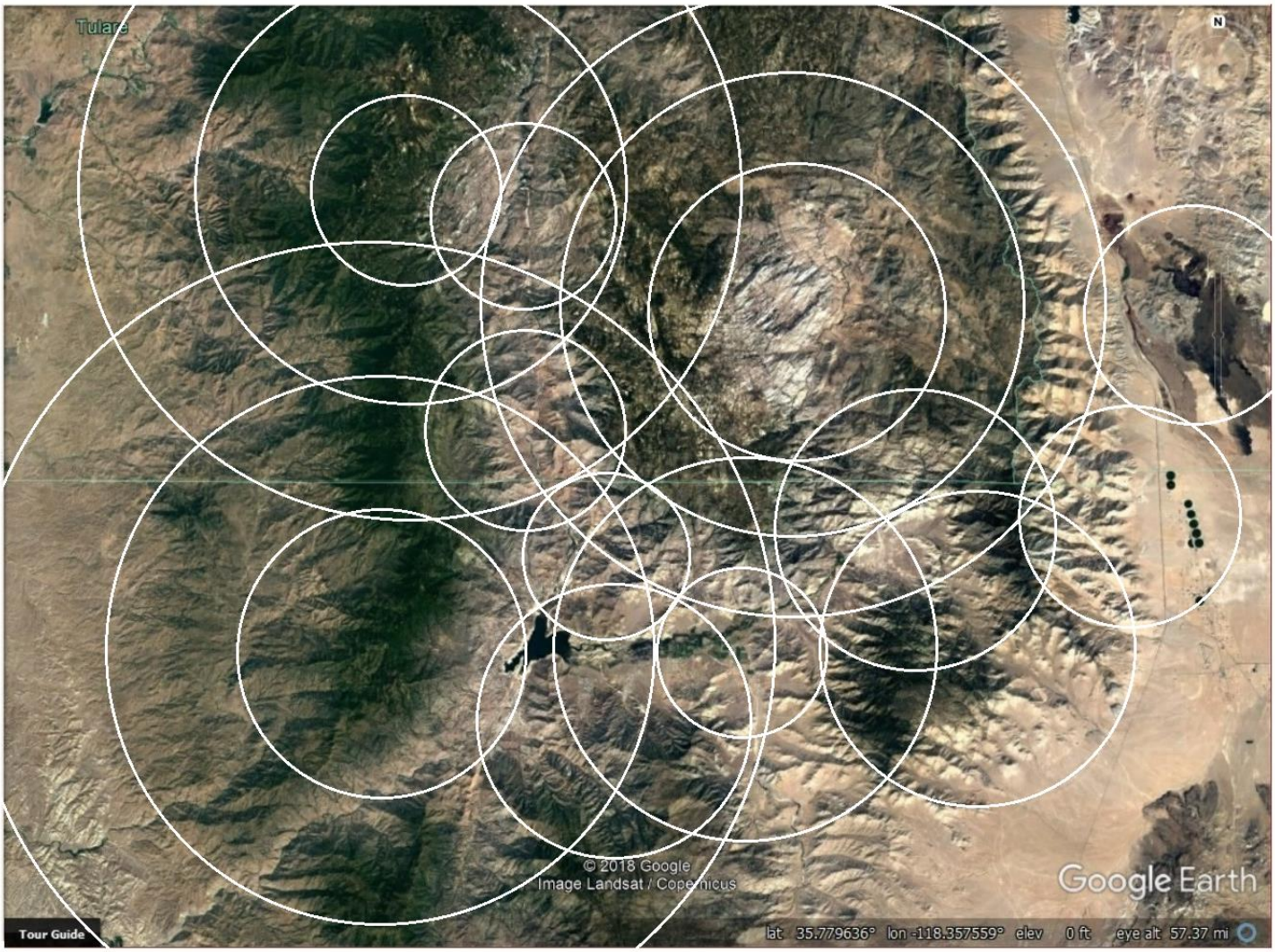


Figure 7.28: This is not all the circular lineaments in this area, but the reader needs to understand how many the author does see. How many additional circles can the reader find for themselves?

Are the many occurrence of repeated trends in each of these areas of California a coincidence or do they represent consistent stresses in the geomorphology of the state? And, if they are consistent over an area the size of California, how can they be insignificant? Gay's (2012) words continue to ring true, "To not attempt to understand lineaments is to ignore one of the most common and basic features in geology." Hopefully, the reader is seeing that they are one of the most common and basic features in geology. And once we see them, if they are this common, how can we continue to ignore them?

Santa Barbara

Figure 7.29: Google Earth image of Santa Barbara, California. Location corresponds with K in Figure 7.1. Images 7.28.1- 7.28.8 explanations consistent with Figure 7.3. (Accessed 2/21/2018.)

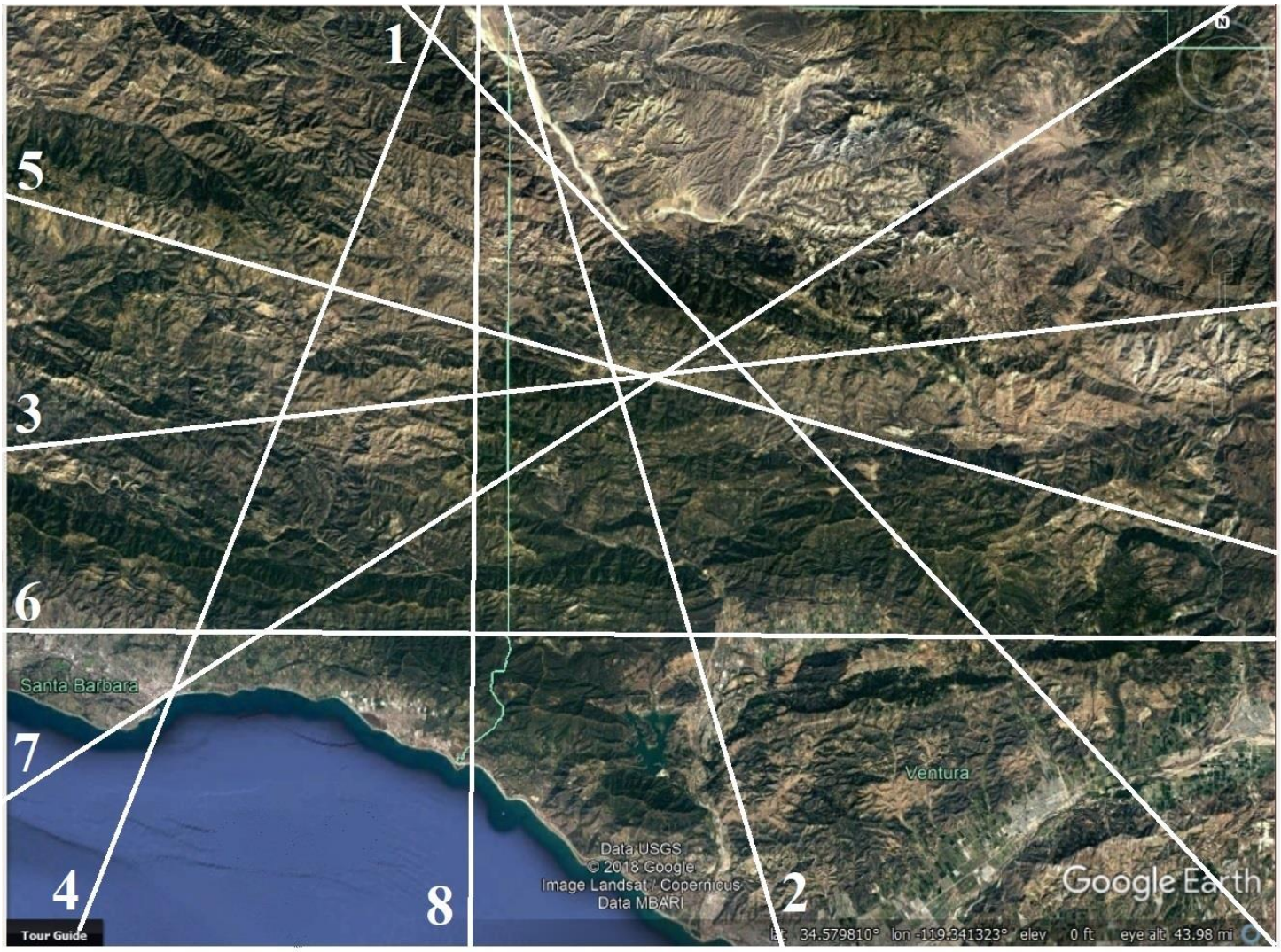


Figure 7.30: Santa Barbara showing direction of all 8 lineament trends.

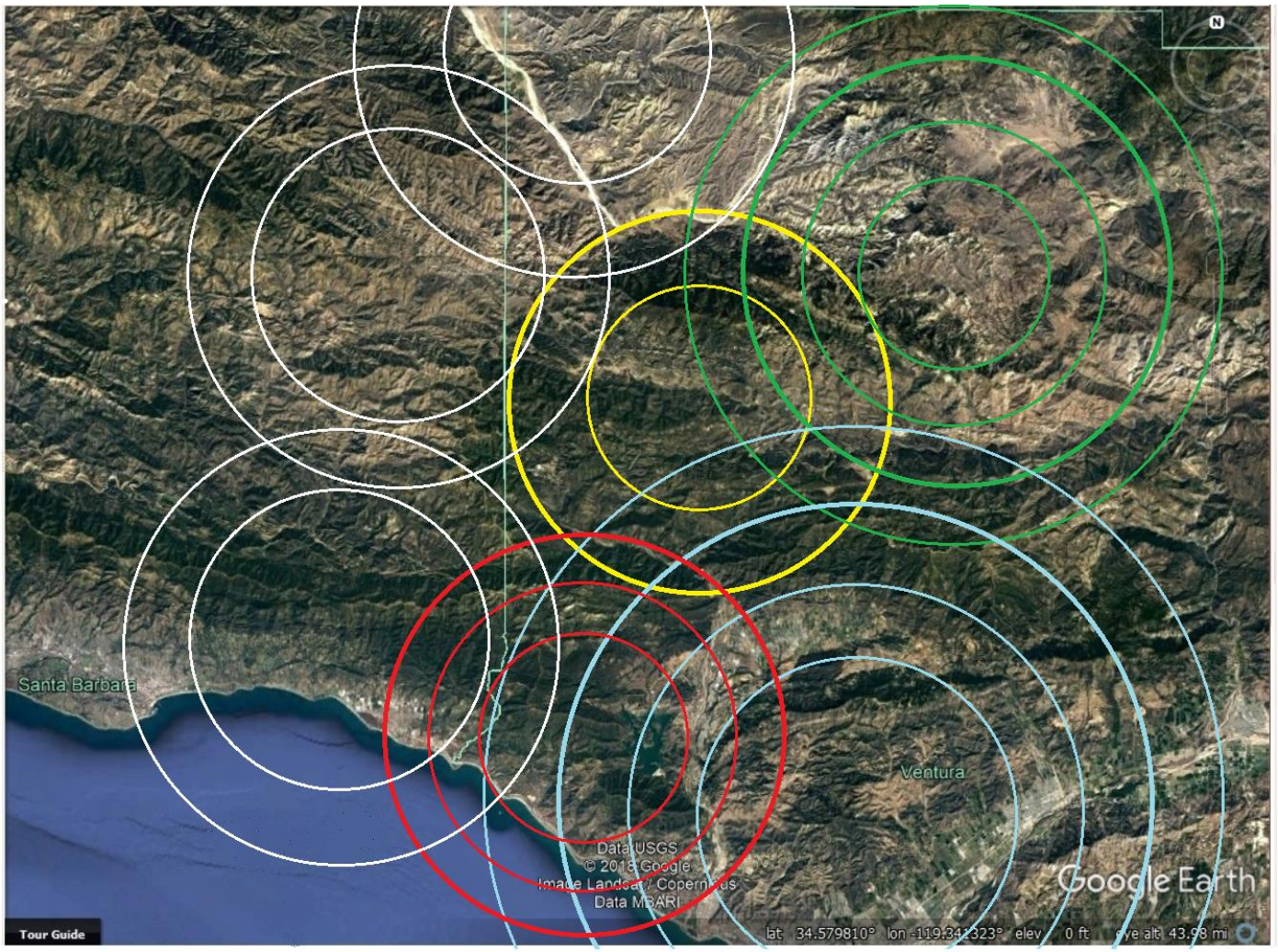


Figure 7.31: Google Earth image of Santa Barbara showing overlapping circular lineaments. The three white ones occurred first, the green was next, followed by the yellow and then the red. The blue one was last, based on the overlapping of mountain crest.

Orange and San Bernardino Counties

The southern portion of the population center of Los Angeles, California, The gray spread across the map is the houses and building of this metropolis.

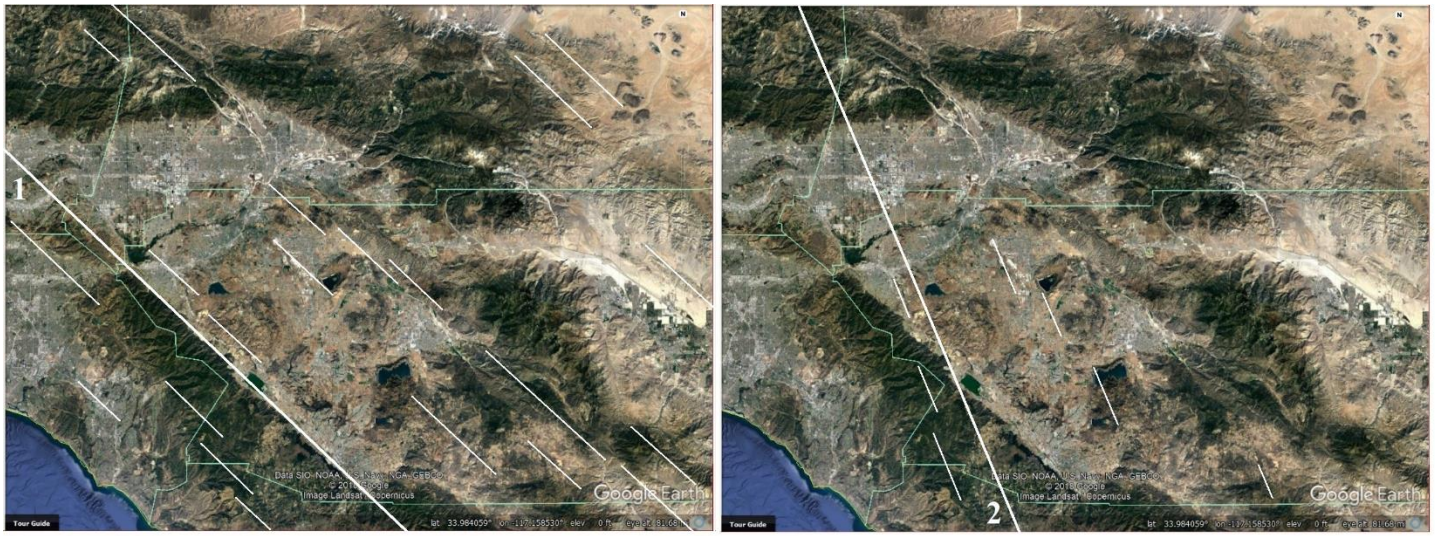


Figure 7.32: Google Earth image of Orange and San Bernardino Counties. Location corresponds with L in figure S1. Images 31.1-31.8: explanations consistent with figure S3. (2018. Accessed 4/21/2018.)

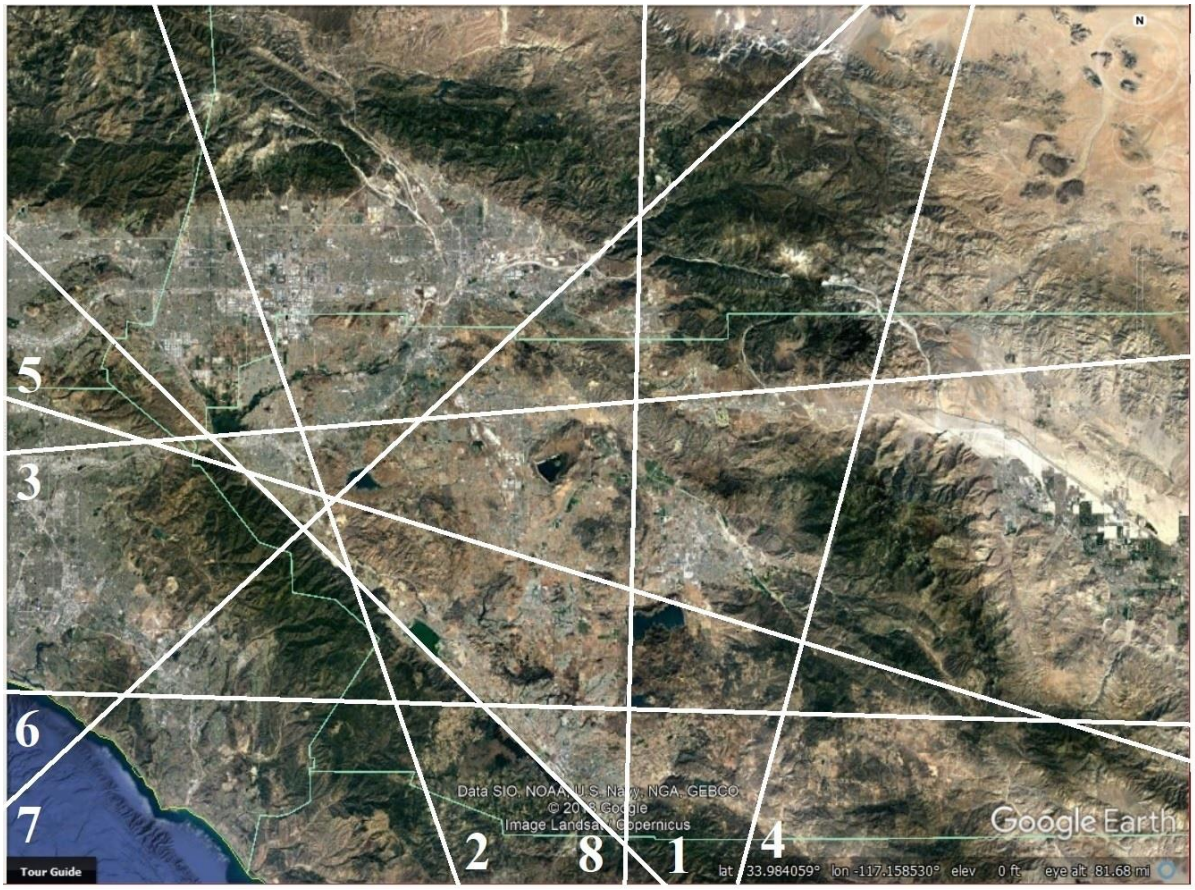


Figure 7.33: Orange and San Bernardino Counties showing direction of all 8 lineament trends.

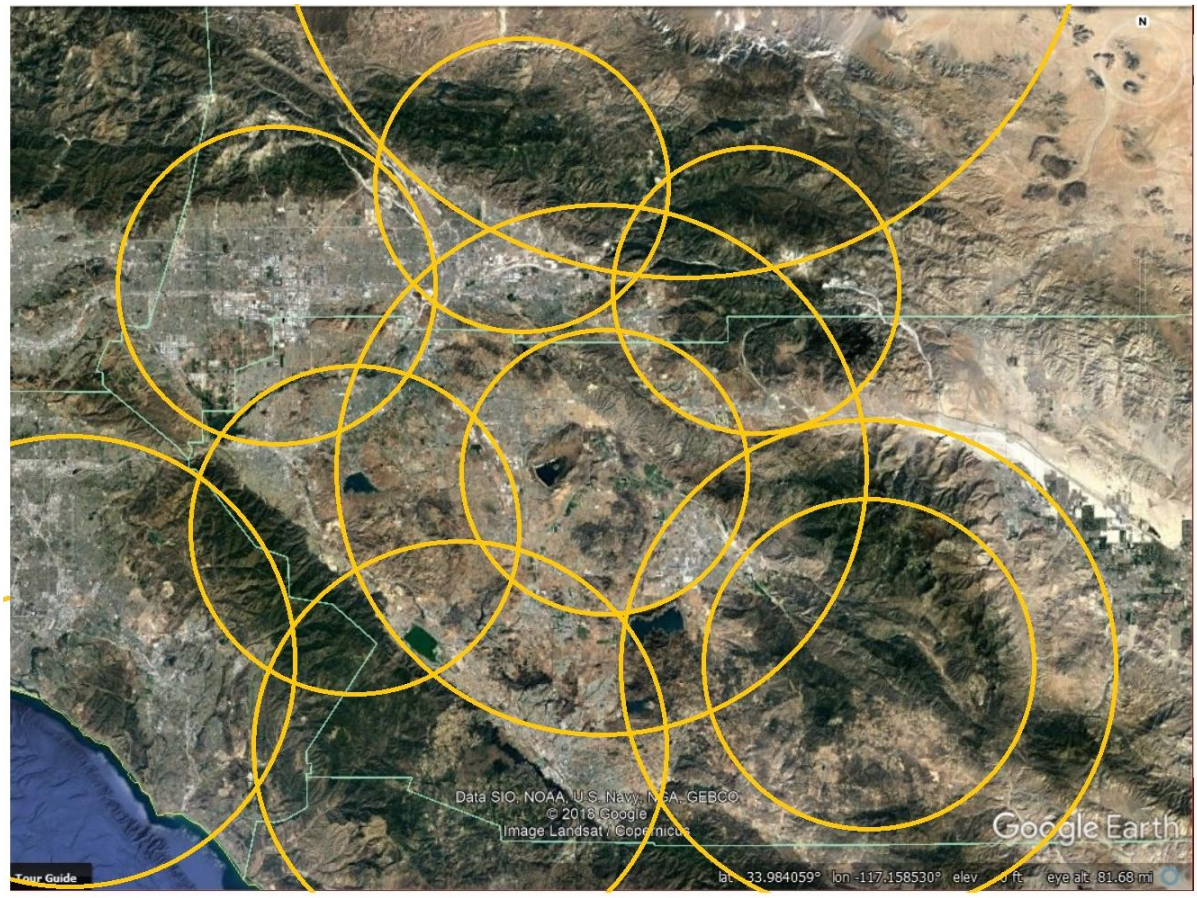
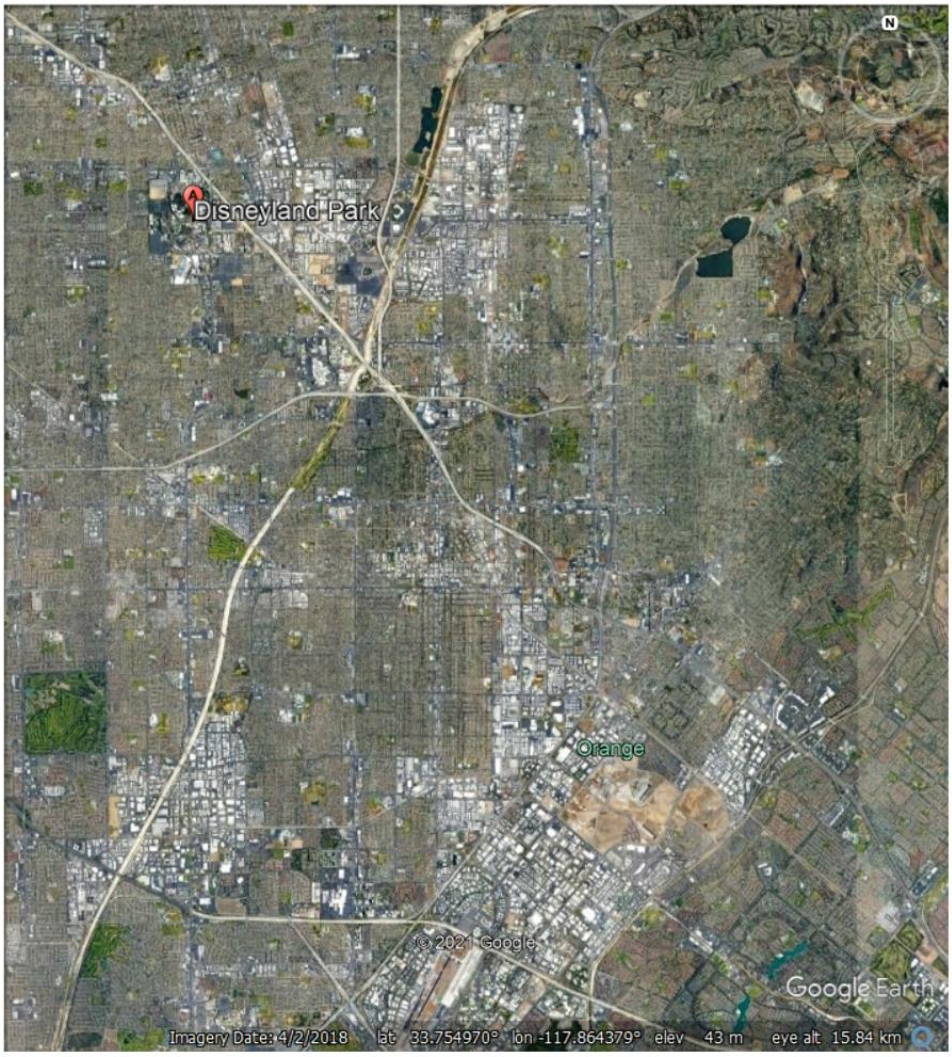


Figure 7.34: Google Earth image of Orange and San Bernardino Counties. View it carefully to see clues for the circular linears in this area.

The heavily build area cannot obscure the linear trends at this resolution. Man might push roads through the hills, flatten a bit for houses. But largely, we are only scratching the surface of the linears. Viewing at greater and greater resolution suggest roads and housing development, since they often follow the terrane, they only serve to emphasize the linears, not obscure them, Figure 7.35.



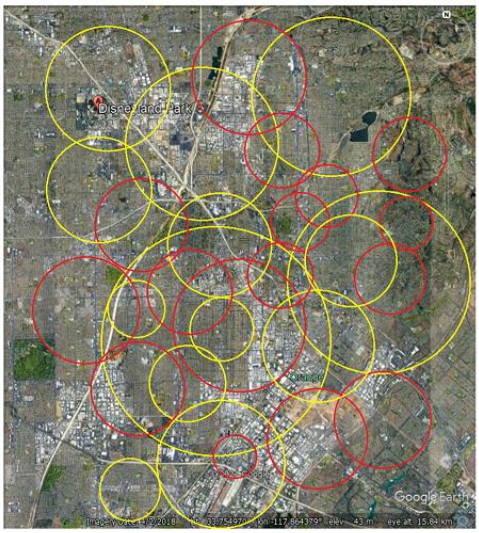


Figure 7.35: The City of Anaheim, California, just east and south of Disneyland. Some of the most densely populated land in Southern California. How many circles can the reader find in this image? Maybe a fifth of the more obvious ones are indicated in the above image. Does that help the reader? Can you locate more? All circles above are perfect circles drawn with Word Paint.

Can you see the evidence for the straight and circular linears in the topography? Once you have started seeing them you wonder, how you have been missing this evidence for so long.

How CGRS working together formed geomorphology

CGRS 1 provides the general structure for much of California. The Sierra Nevada Mountains are interpreted as a manifestation of the shock-release wave structure, a high up-thrust (shock wave) is followed by a low-reaching expansion/release wave, the Central Valley, which was then followed by a smaller up-thrust (Rebound Wave), the Coastal Range. This is evidenced by the general description of the Pacific CGRS in fracture zones (Chapters 1 & 3). While the ridges of hills in the Coastal Range, as shown in Figures 7.8.1, 7.19.1, 7.28.1 and 7.31.1, follow CGRS 1, some lineaments of the Coastal Range, as indicated by the two white arrows of Figure 7.34 (B), are slightly arced, showing other CGRS added their arced energies to raise specific locations in the ridge. CGRS 1 centers in the Great Bight south of Australia. It comes from the southwest, making the CGRS's order of shock-wave followed by release-wave manifestation visible in order progressing towards the northeast.

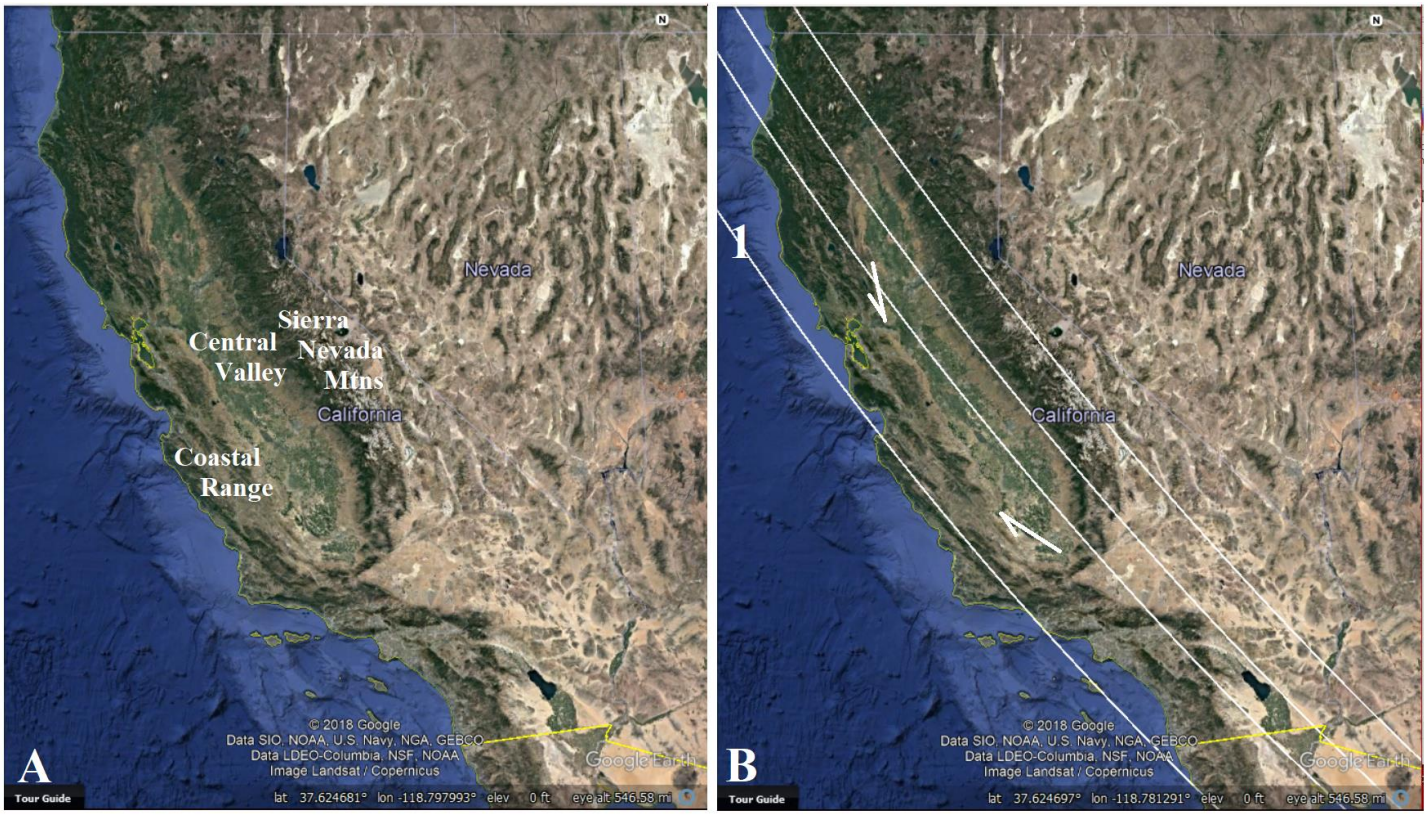


Figure 7.36: Google Earth image of California's Coastal Range showing several concentric trends in CGRS 1. (2018. 37.624681°N, -118.781291°E. Accessed 28 April 2018.)

The Verdi contribution

If CGRS 1 is primarily responsible for California's topography, why are not the mountains and valley one long straight structure as seen in the Pacific fracture zones? Why does it bend like the Murry Fracture Zone (Chapter 3-4)? Because two different CGRS coming from opposite directions formed it. The northern half follows CGRS 2, and centers in the Atlantic at the Verde islands off the western coast of Africa. This makes the Coastal Range and Klamath Mountains the higher frontal shock wave and the Cascade Mountains to the east the following lower Rebound Wave (Chapter 1). This arrangement is the opposite of CGRS 1. This is an important aspect of lineaments. Topography and gravity anomaly are always the combined expression of multiple CGRS, and the direction of the center/origin is one of the major considerations.

Figure 7.37B shows, with arrow pairs, three additional concentric linears to lineament 2. The middle one is darker, suggesting it has deeper soil, growing larger trees. That would be in keeping with a release-wave valley, which had not washed alluvium out of the valley. The two outside linears show additional raised expression where they added to lineament 1 shock-waves. Figure 7.37C shows four lineaments associated with trend 1. The most southwesterly one largely follows the San Andreas Fault, while the most northeasterly one, defines the general trend of the Sierra Nevada Mountains. The two middle ones would logically be the release-wave valley, but in the most southerly part of the state, they have some distinct high shock-wave expressions, showing interpretation is not always straight forward. Figure 7.37D shows how the general trend of 1 and 2 define the "dog leg" bend in California's central valley, which comes from recognizing and understanding the lineaments involved.

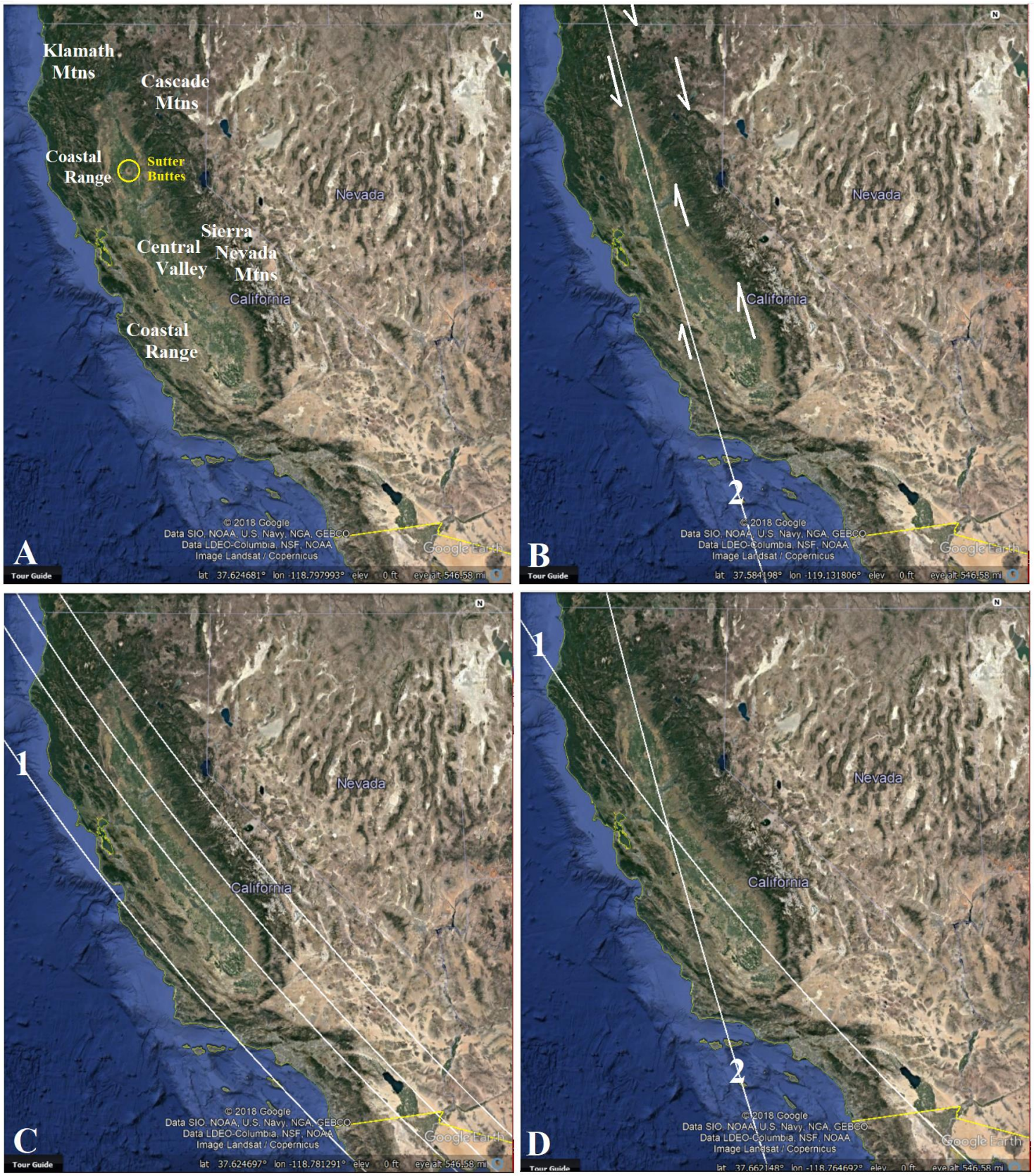


Figure 7.37: Google Earth image of California's Central Valley. (B) Showing path of CGRS 2, Verdi center (C) Showing path of CGRS 1, Great Bight center. (D) Showing the combined paths defining the two angles of the Central Valley.

The Gulf of Mexico's contribution

Figure 7.38A shows lineament 4 which centers on the Gulf of Mexico, producing a trough extending from the Sierras to the north extension of San Francisco Bay, through the Golden Gate, Figure 7.38B. Such a trough would correspond to a release-wave valley. Broken white lines indicate linears that correspond to the edges of the trough. The trough's width shows why one lineament often does not sufficient to define the structure.

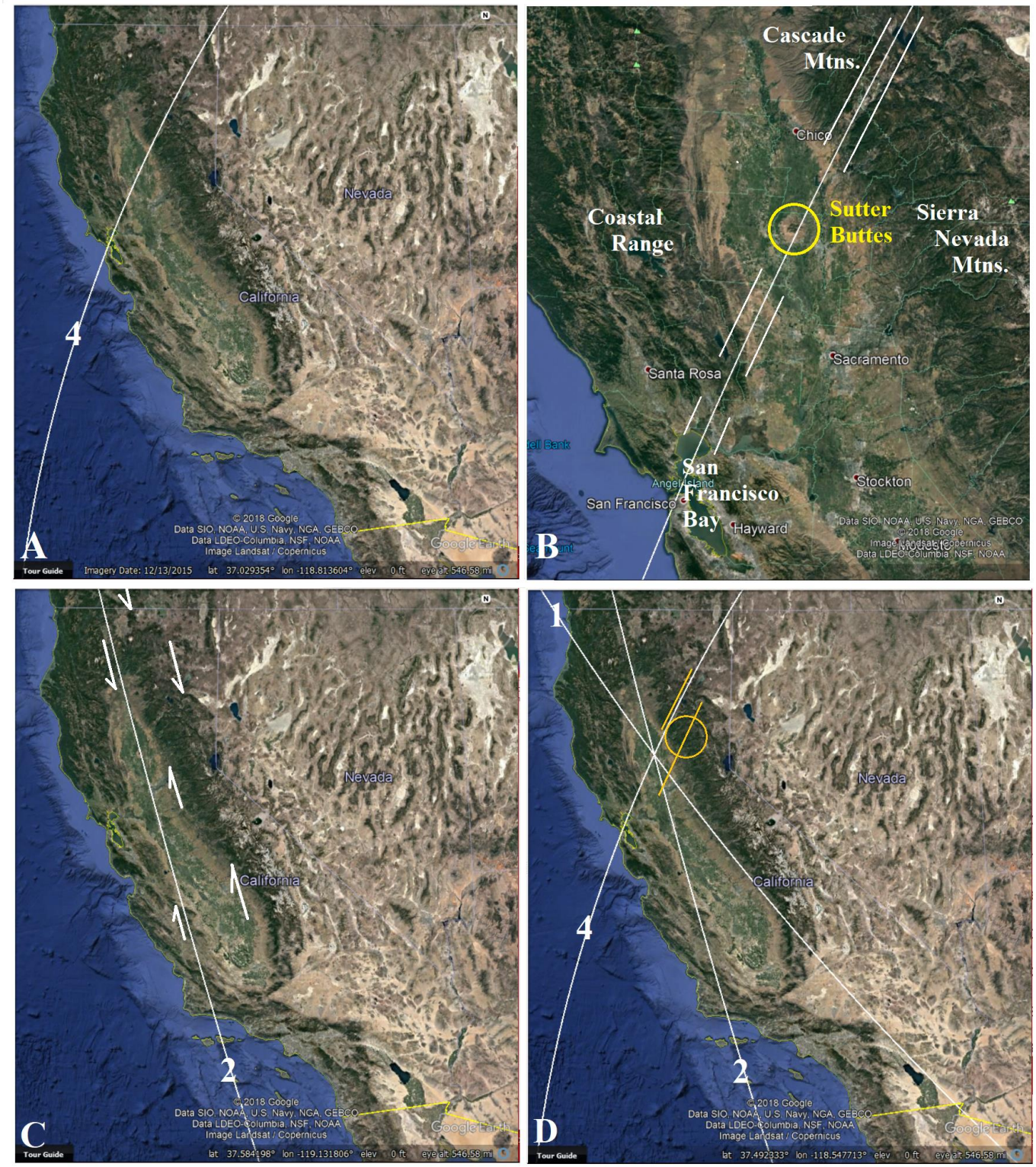


Figure 7.38: Google Earth image of California's Central Valley. (B) Showing path of CGRS 4 with added lineaments. (C) Showing path of CGRS 2 with additional lineaments. (D) Showing combined paths centers on Sutter Buttes with additional linears and circle.

Lineament 4 is also responsible for the divide between the expression of the Cascades to the north and the Sierras to the south, Figure 7.38D. Northern half of orange circle is the Feather River, classically cited as the dividing line. It is popularly attributed to the Mendocino fracture zone, but the short linear, trend 4, that divides the circle suggest cratering provide a better alternative.

As lineament 2, Figure 7.38C, provides a release-wave from the left pair of arrows, where the southern one points out a low section in the arced energy ridge from Figure 7.36B. When the release-waves from all three CGRS corresponds this may have opened up access to the gas-magma eruption that formed Sutter Buttes.

Making an earthquake zone

CGRS 1 lies concentric to the San Andreas and multiple smaller faults, as indicated by Figure 7.39B. It has a single major expression north of CGRS 7, but multiple ones south of CGRS 3. Sections of CGRS 7, northeast of CGRS 1 are known as the Garlock Fault. There are many named faults in this area, but a limited number of CGRS trends are involved identifying the impact center for many of the faults.

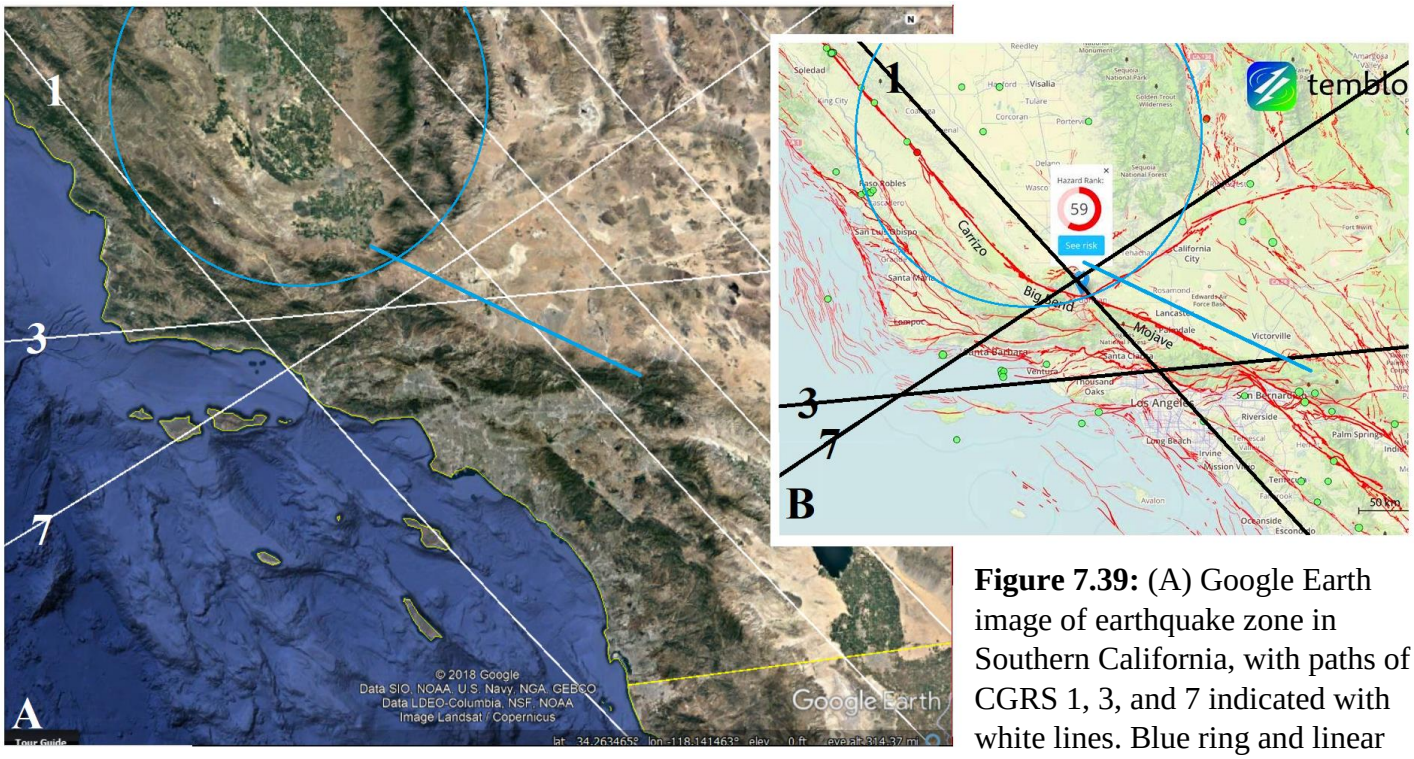


Figure 7.39: (A) Google Earth image of earthquake zone in Southern California, with paths of CGRS 1, 3, and 7 indicated with white lines. Blue ring and linear represent two important sources for quakes not among the eight linears mapped in this paper. (B) USGS map (2017) of the major earthquake faults in Southern California has heavy red lines representing San Andreas concentric to CGRS 1 except for section concentric to the blue lines. With direct correspondence to faults it is hard not to conclude these 5 lineaments and their concentric expression as fault are the cause of the areas earthquakes. (A) Use this map to search for traces of the linears that show expression of lineaments. Seeing numerous examples should help the reader identify lineaments. (B) Clear expressions of the CGRS in California at this resolution. Lineaments do not just contribute to the geomorphology, they determine it. If we want to know the true causes behind the geologic structures in California, we have to become familiar with the impacts that contributed their energy to shape the state.

Centers of these linears are the same as in Table 6.1.

References

Gay, S.P. 2012. Joints, Linears, and Lineaments – The basement connection. *Search and Discovery Article #41083.* http://www.searchanddiscovery.com/pdfz/documents/2012/41083gay/ndx_gay.pdf.html Accessed 07/13/2016, page 3.

Gutierrez, C., Bryant, W., Saucedo, G., and Wills, C. 2010. California geologic data map series map no. 2 – Geologic map of California. California Geological Survey. Scale 1:750,000.

Hausback, B.P., L.J.P. Muffler, and M.A. Clynne. 2011. *Sutter Buttes--The Lone Volcano in California's Great Valley*. U.S. Geological Survey, Fact Sheet 2011-3024.

USGS. 2017. www,geologyin.com/2017/03/usgs-study-finds-new-evidence-of-san.html. Accessed 5/16/2018.