

# Mapping tectonic faults from geomorphology

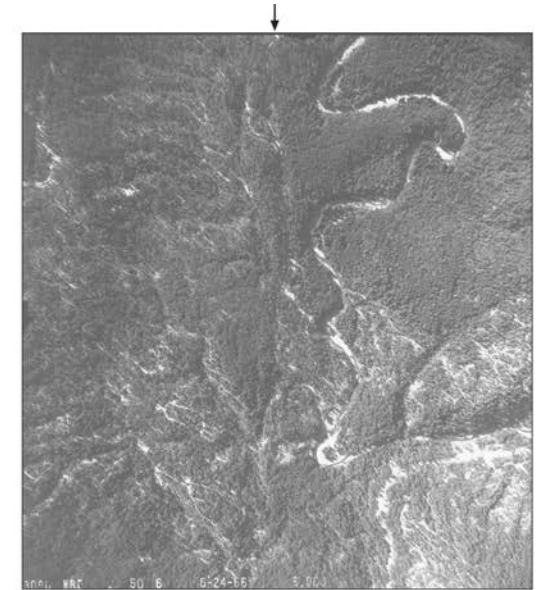
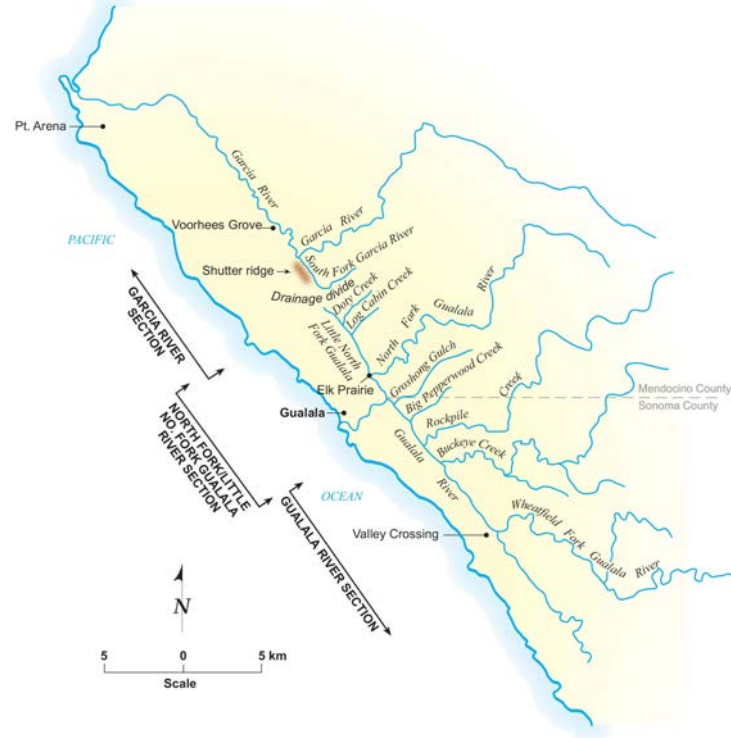


Strike-slip faults:  
Mapping examples from Alaska and N. California  
February 10, 2022

# San Andreas fault, northern California



Koehler et al., 2005



San Andreas fault



San Andreas fault

**Table 1. Geomorphic Symbol Codes used in Map Compilation**

| Geomorphic Feature                   | Symbol |
|--------------------------------------|--------|
| Scarp (northeast facing)             | s (NE) |
| Scarp (southwest facing)             | s (SW) |
| Pond                                 | p      |
| Swampy depression                    | ds     |
| Dry linear depression or swale       | d      |
| Saddle                               | sa     |
| Spring                               | sp     |
| Linear valley                        | lv     |
| Linear drainage                      | ld     |
| Swale                                | sw     |
| Linear break in slope                | bs     |
| Bench                                | b      |
| Tectonic ridge                       | r      |
| Stream knickpoint                    | kp     |
| Vegetation lineament                 | v      |
| Drainage divide                      | dd     |
| Offset stream channel                | os     |
| Beheaded or abandoned stream channel | bs     |
| Deflected stream                     | ds     |
| Pirated channel                      | pc     |

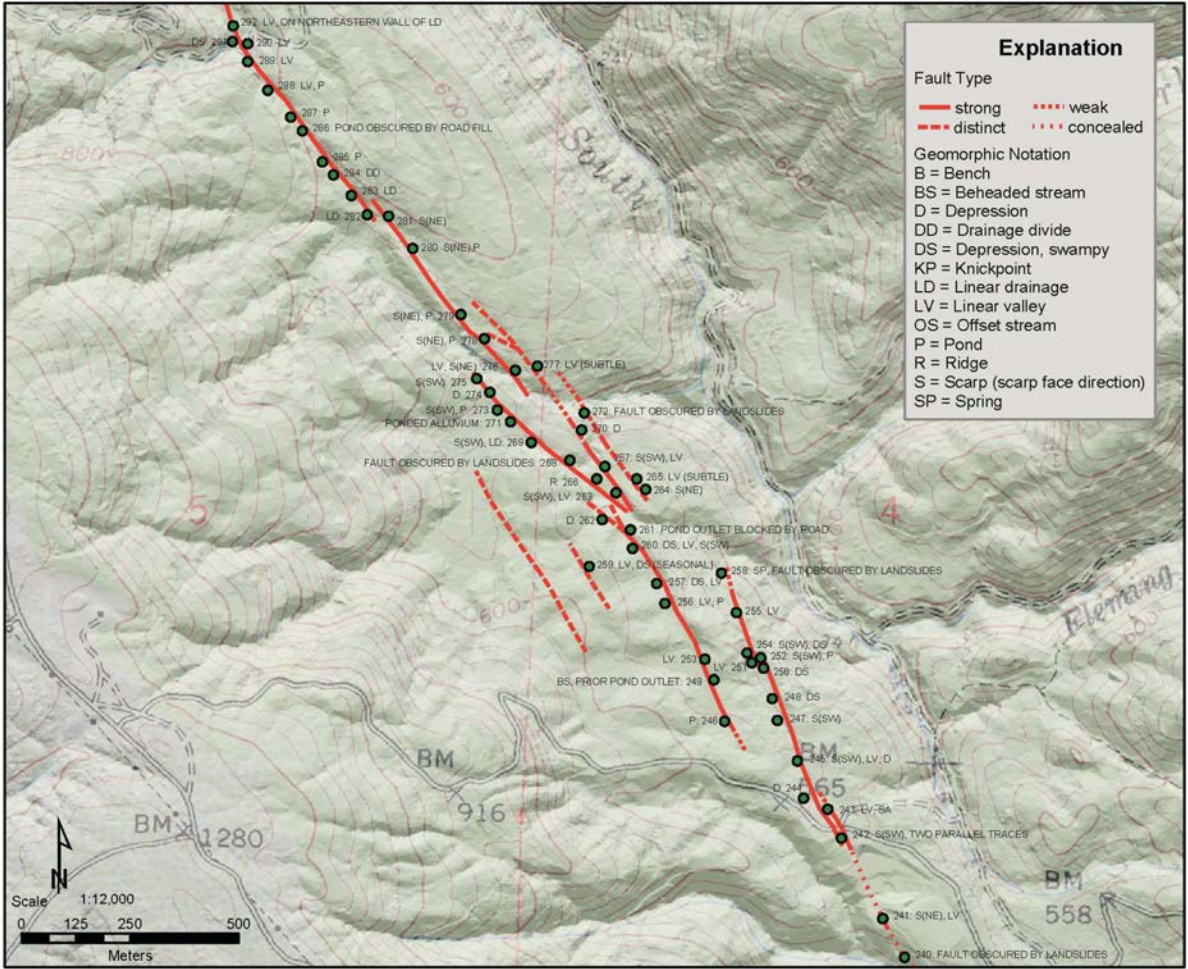
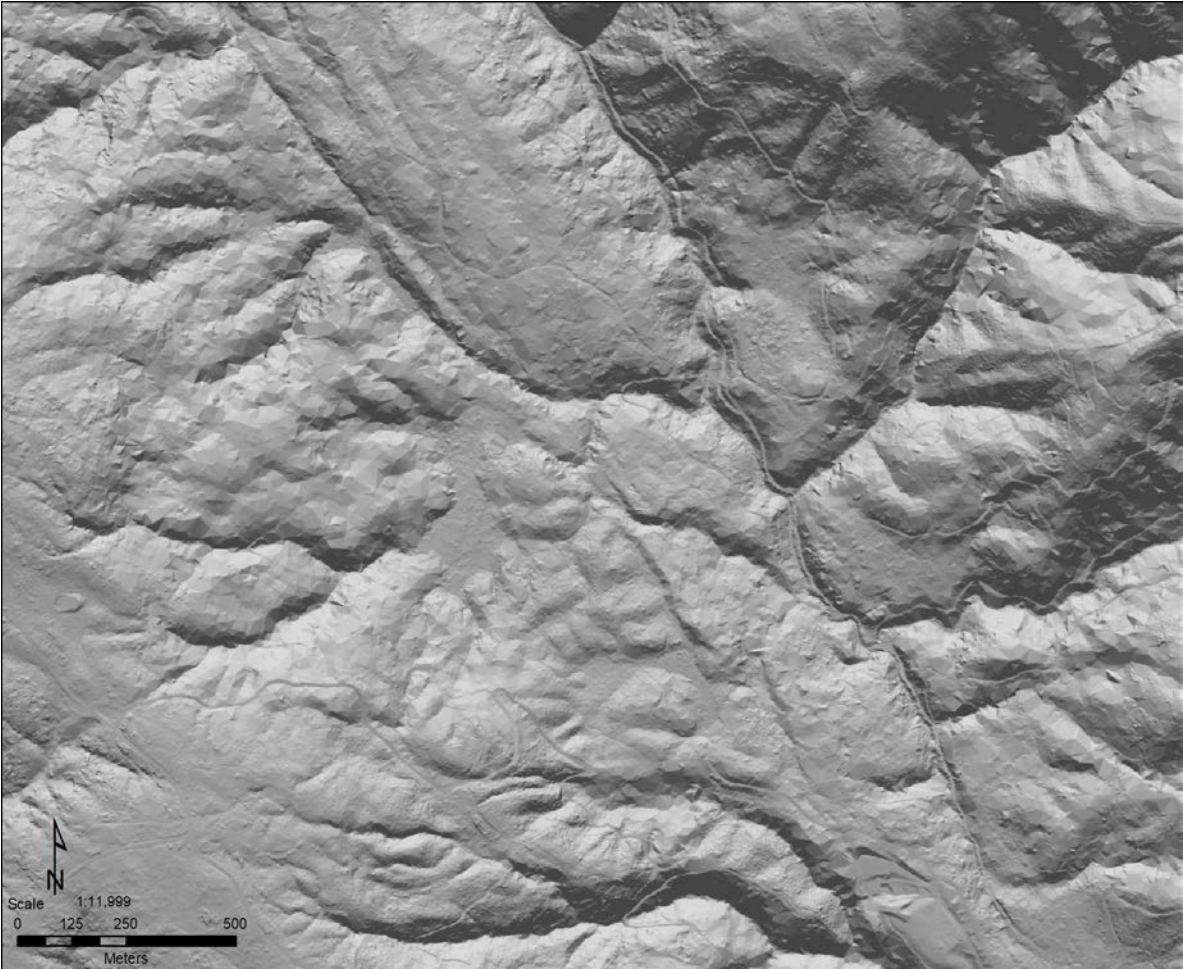


Linear trough and uphill facing scarp

Keeping track of features using site numbers

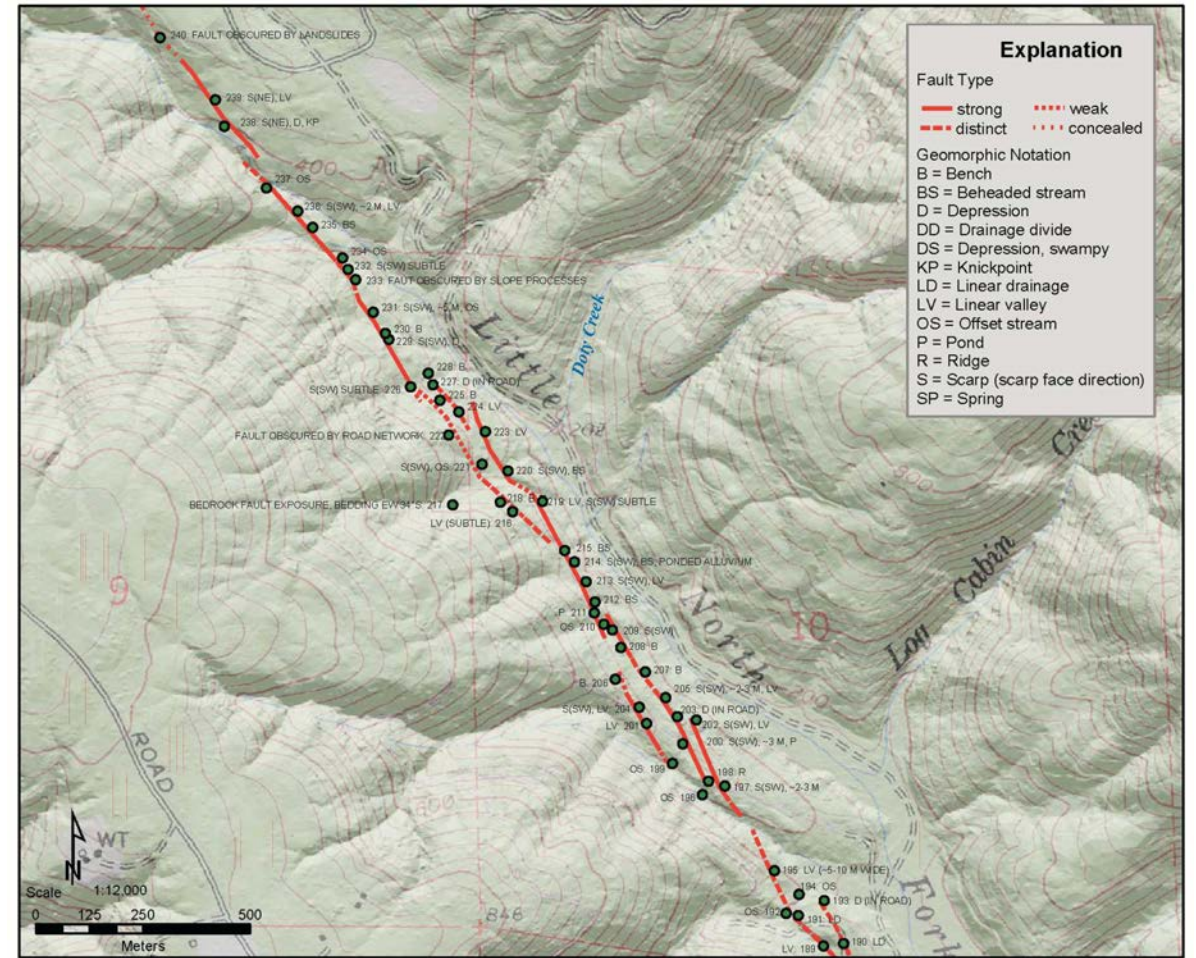
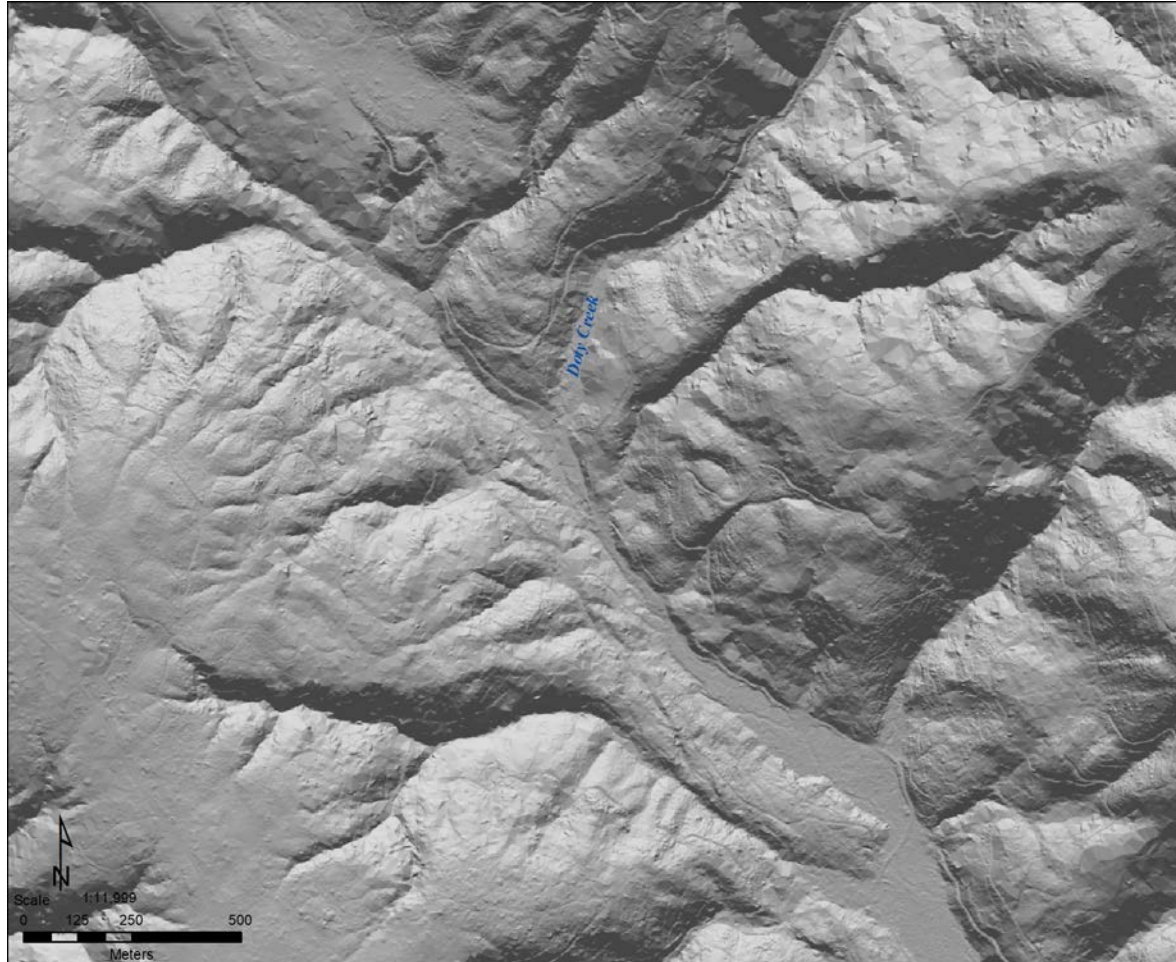
| Location  | Geomorphic Feature                   | Site Number  |
|---|--------------------------------------|--|
| ~ 3 km south of Annapolis Road to Buckeye Creek | Ponds and swampy bogs                | 1, 2, 6, 8, 11, 12, 16, 21, 22, 23, 24, 26, 28, 30, 31, 33, 35, 39, 45, 47, 50, 59, 70, 72, 74, 75, 79, 81 |
| ~ 3 km south of Annapolis Road to Buckeye Creek | Scarps                               | 36, 40, 42, 48, 49, 52, 54, 61, 77, 86, 87, 90, 92, 94   |
| ~ 3 km south of Annapolis Road to Buckeye Creek | Offset streams and beheaded channels | 3, 4, 5, 7, 9, 10, 20, 27, 32, 34, 55, 56, 64, 69, 71, 84, 85, 93  |
| Buckeye Creek to Big Pepperwood Creek           | Ponds and swampy depressions         | 96, 99, 103, 110, 119, 120, 137  |
| Buckeye Creek to Big Pepperwood Creek           | Scarps                               | 97, 99, 101, 102, 104, 110, 115, 122, 123, 124, 126, 129, 134, 142   |
| Buckeye Creek to Big Pepperwood Creek           | Offset streams and beheaded channels | 116, 118, 125, 136, 142, 144   |

# Lidar and field mapping, northern San Andreas fault

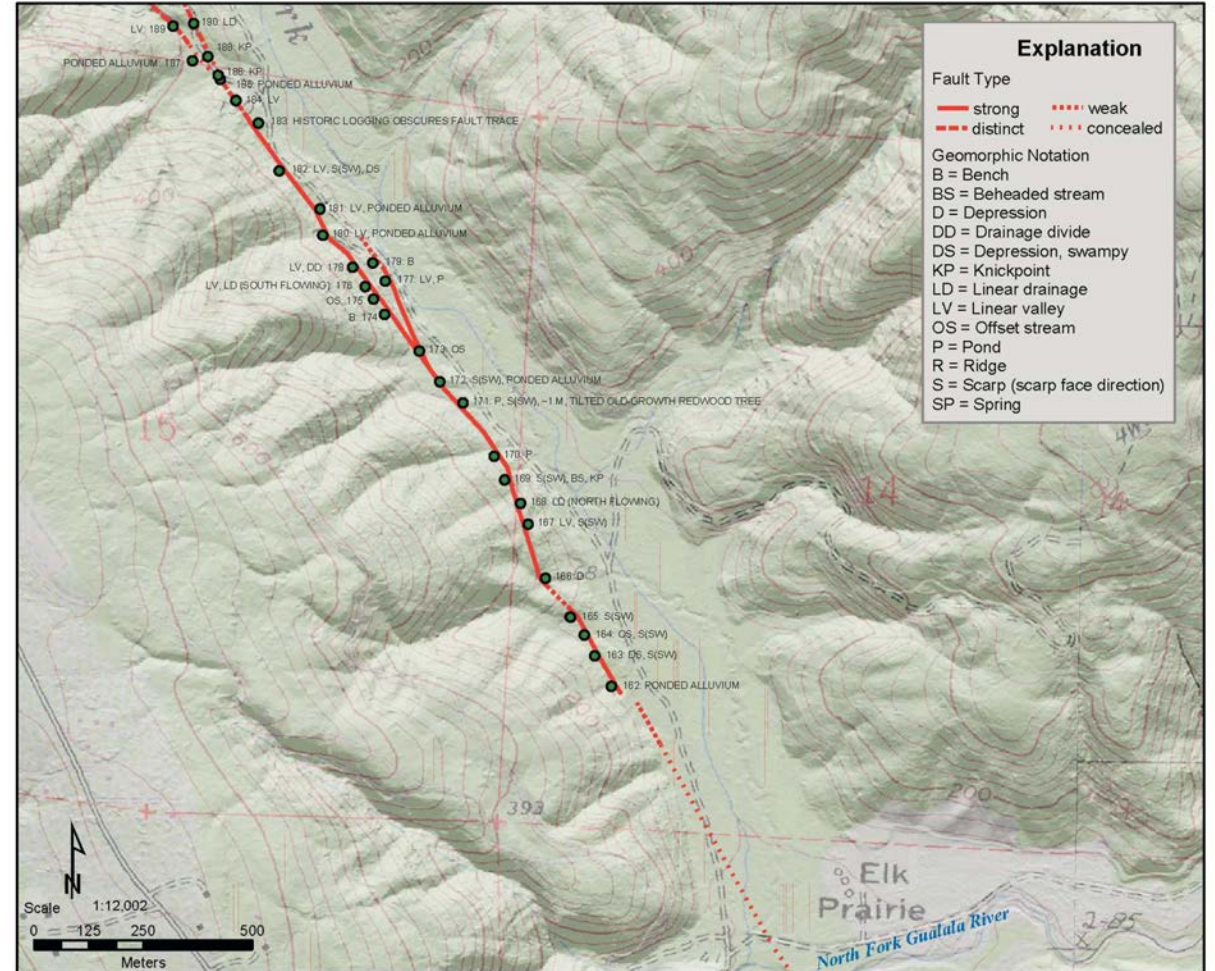
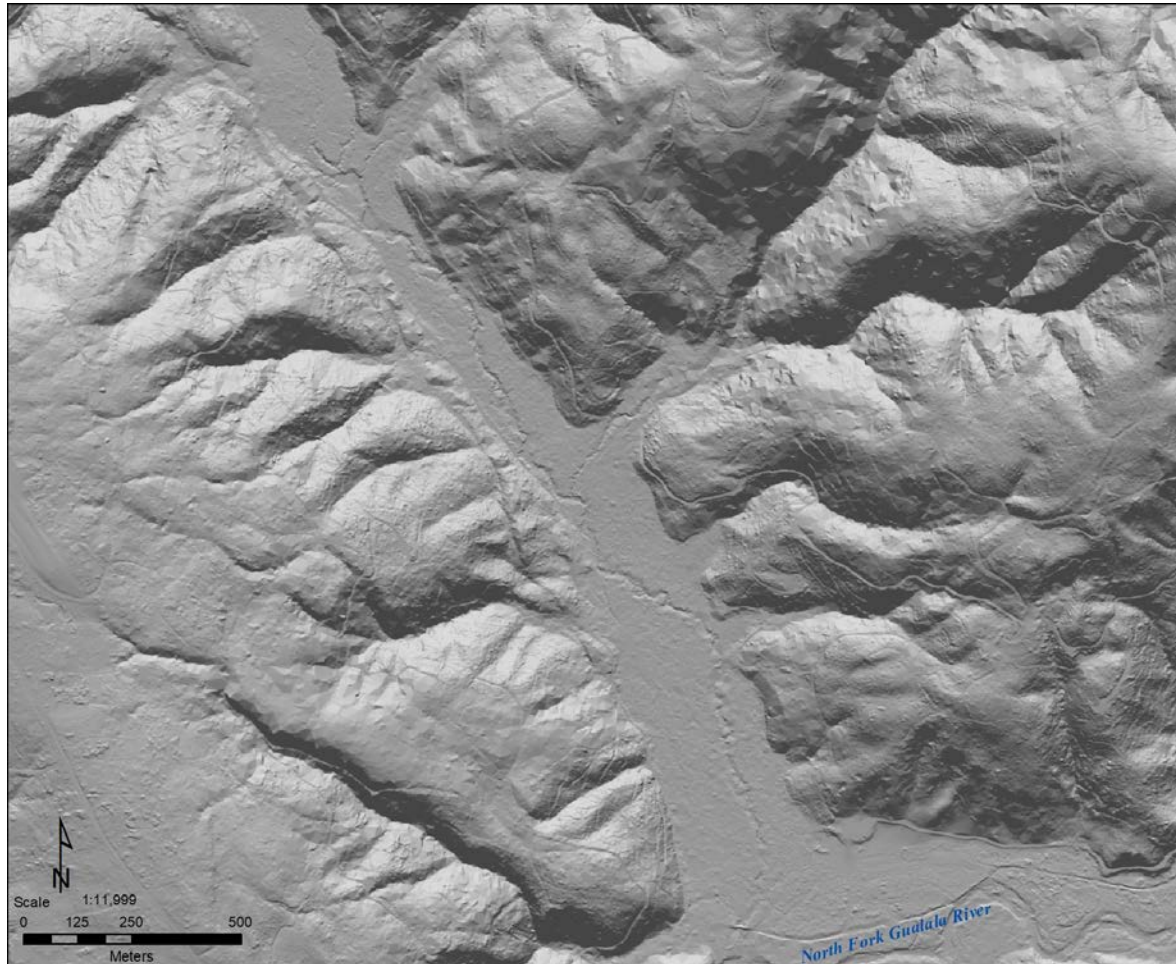




# Lidar and field mapping, northern San Andreas fault

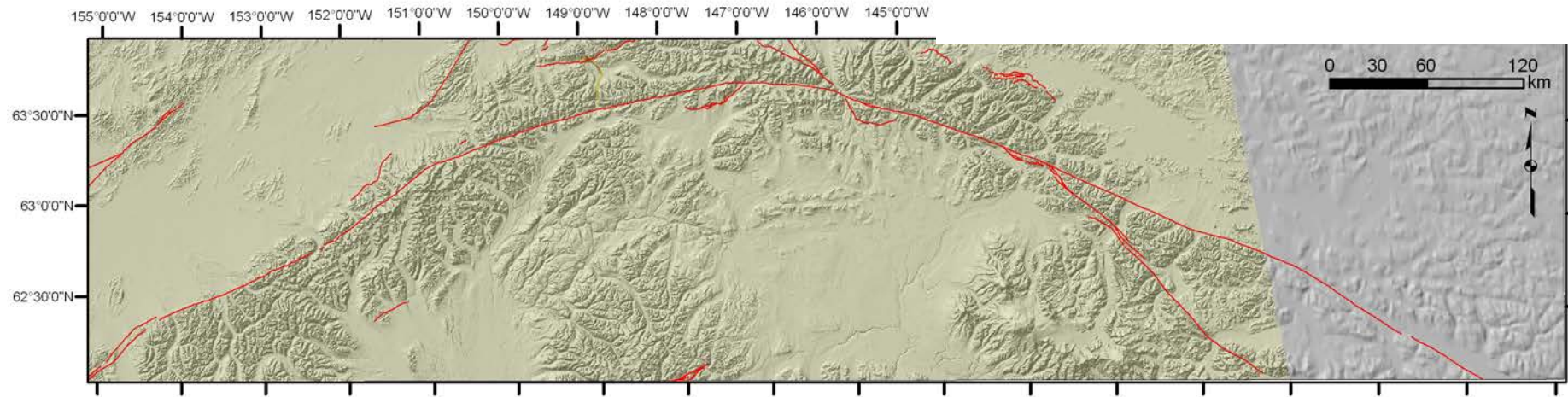
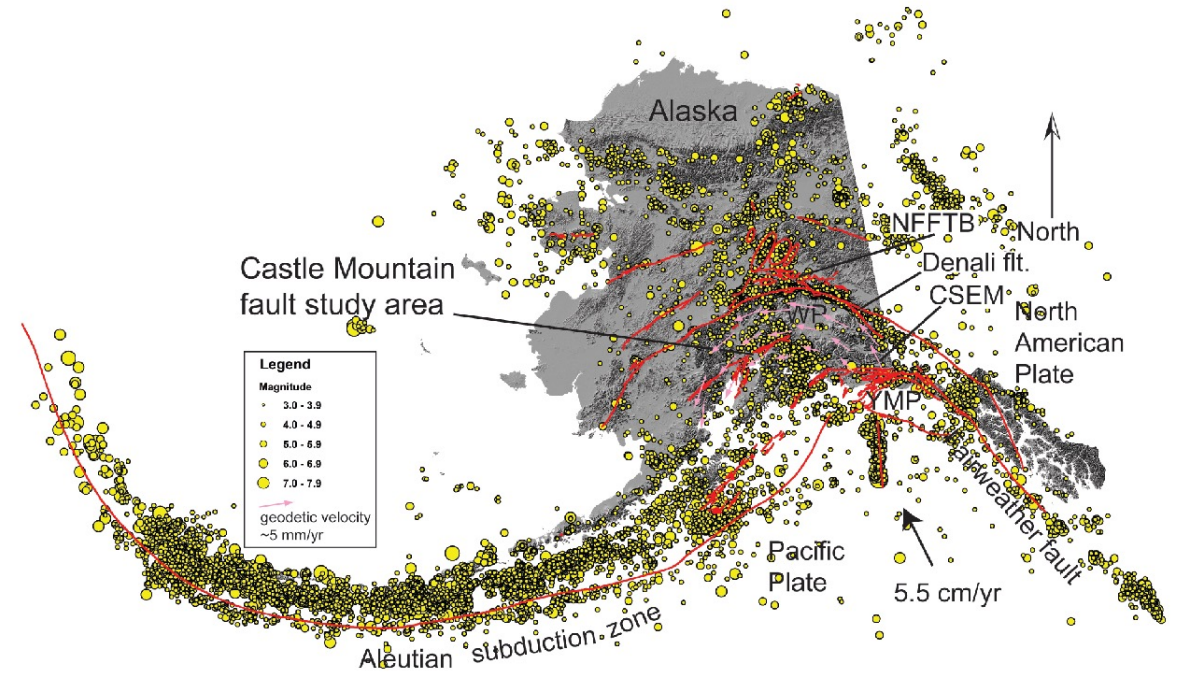


# Lidar and field mapping, northern San Andreas fault



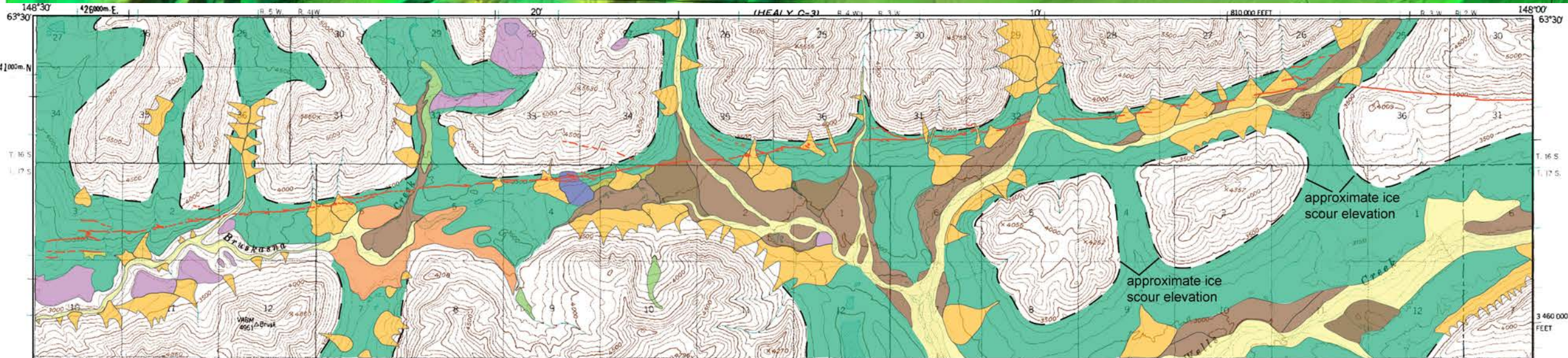
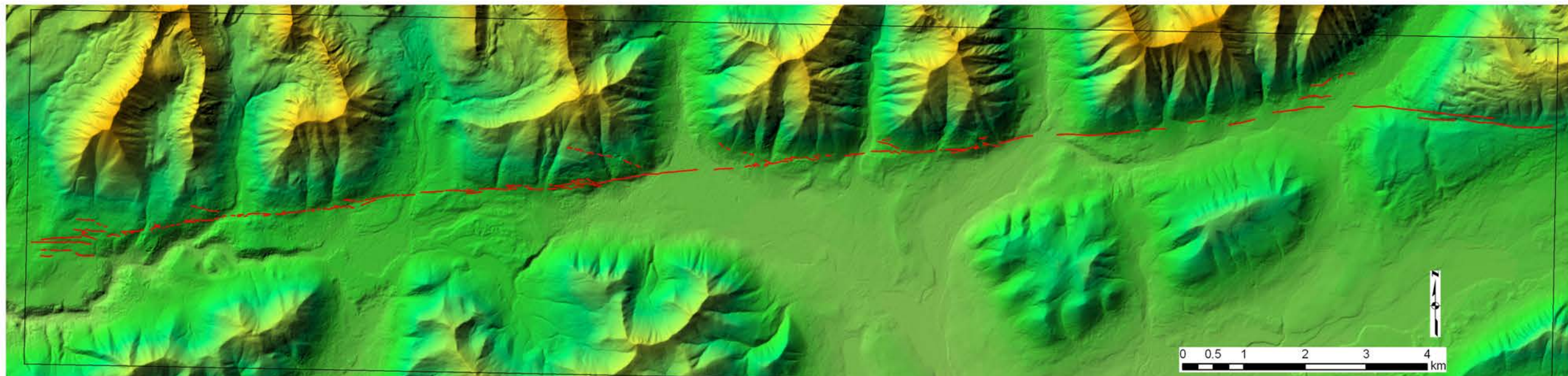











# Alaska tectonics

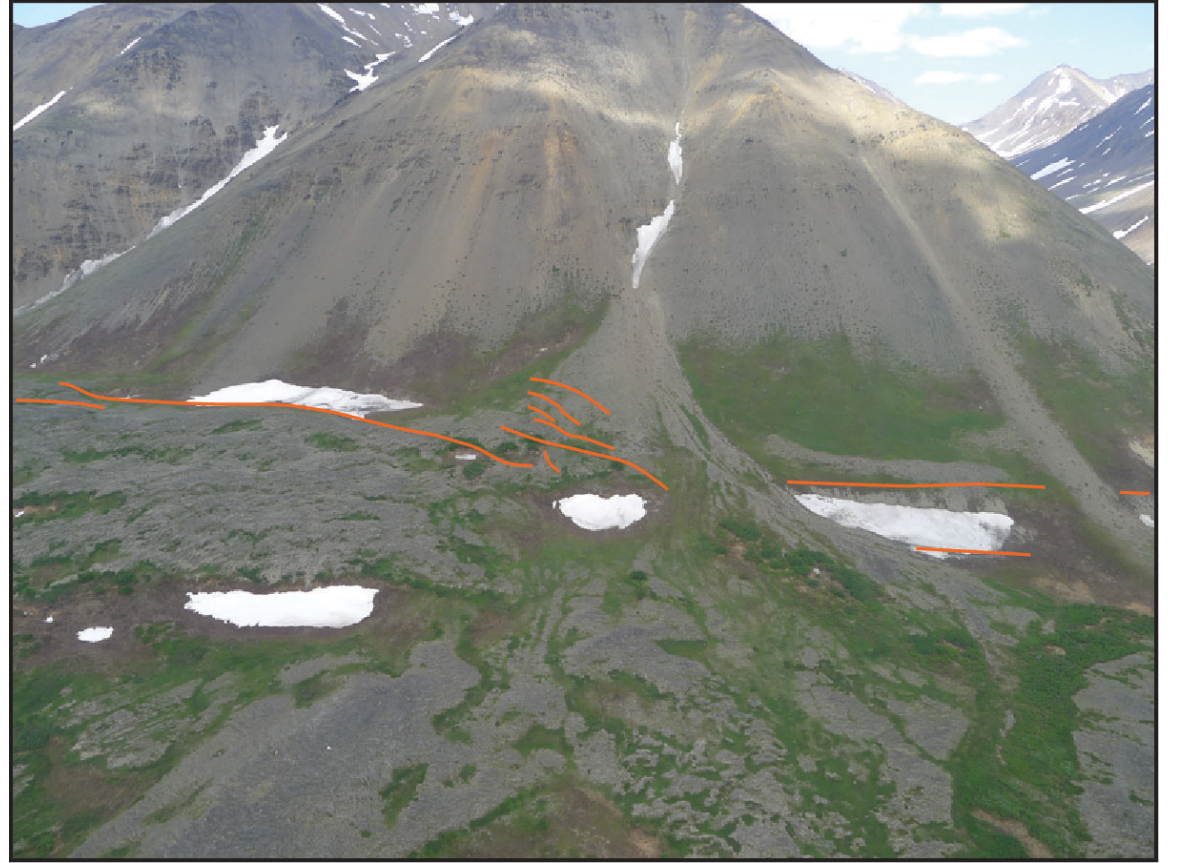
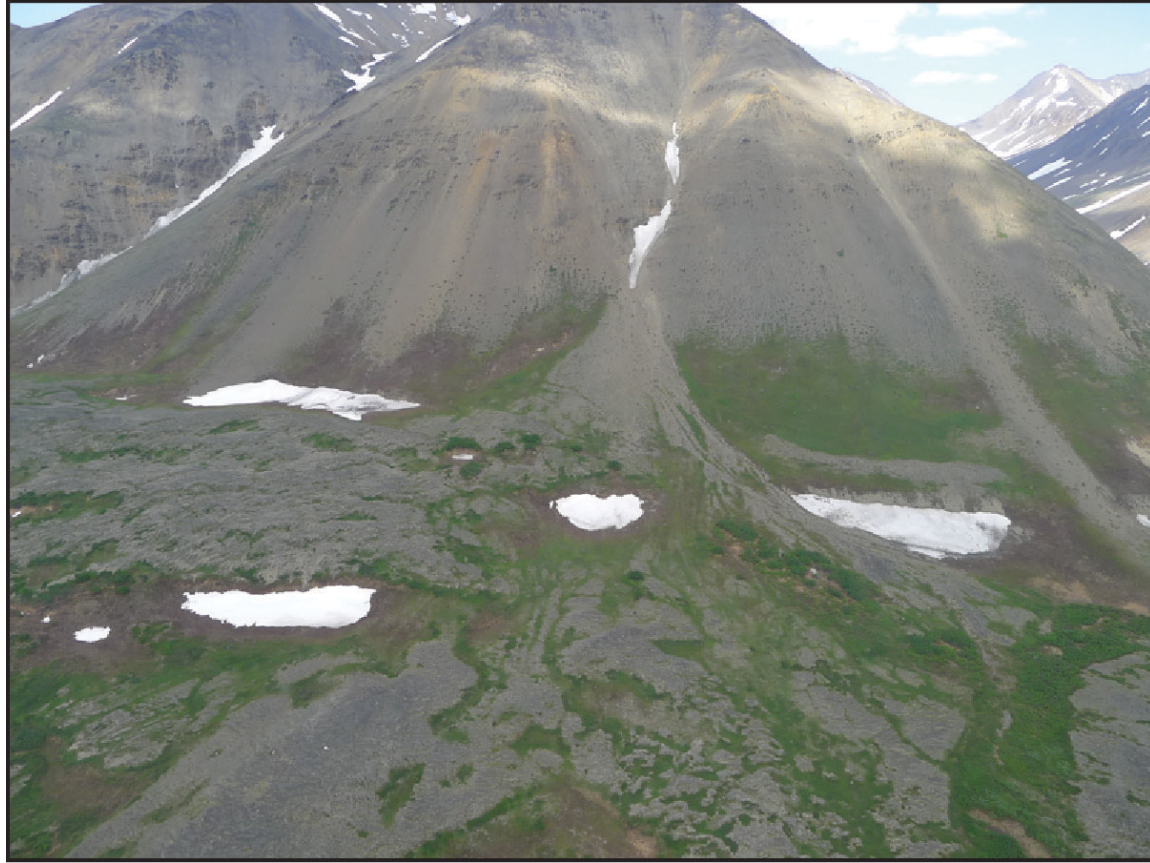




# IfSAR and Quaternary surficial mapping



- |   |  |   |  |  |
|---|--|---|--|--|
|  Active stream alluvium                 |  Stream alluvium, in terraces and fans (relatively young) |  Rock avalanche deposit      |  Glacial Moraine deposits |  Ice scoured bedrock and isolated ground moraine deposits |
|  Debris flow and avalanche fan deposits |  Stream alluvium, in terraces and fans (relatively old)   |  Ice impounded lake deposits |  Ground Moraine deposits  |  |



# Air photo mapping

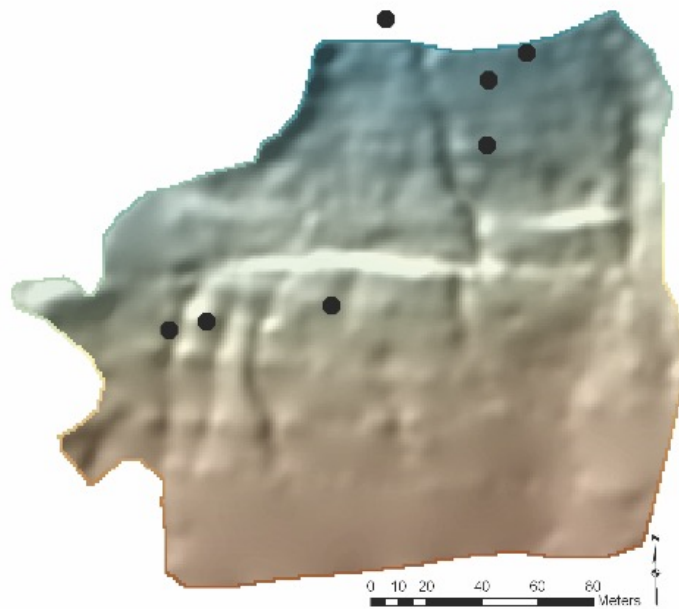


# Air photo mapping

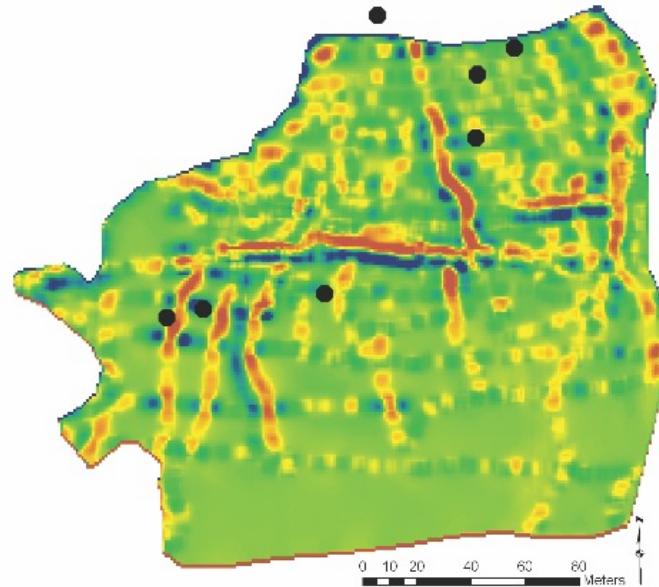




Differential GPS survey



Offset avalanche debris fan

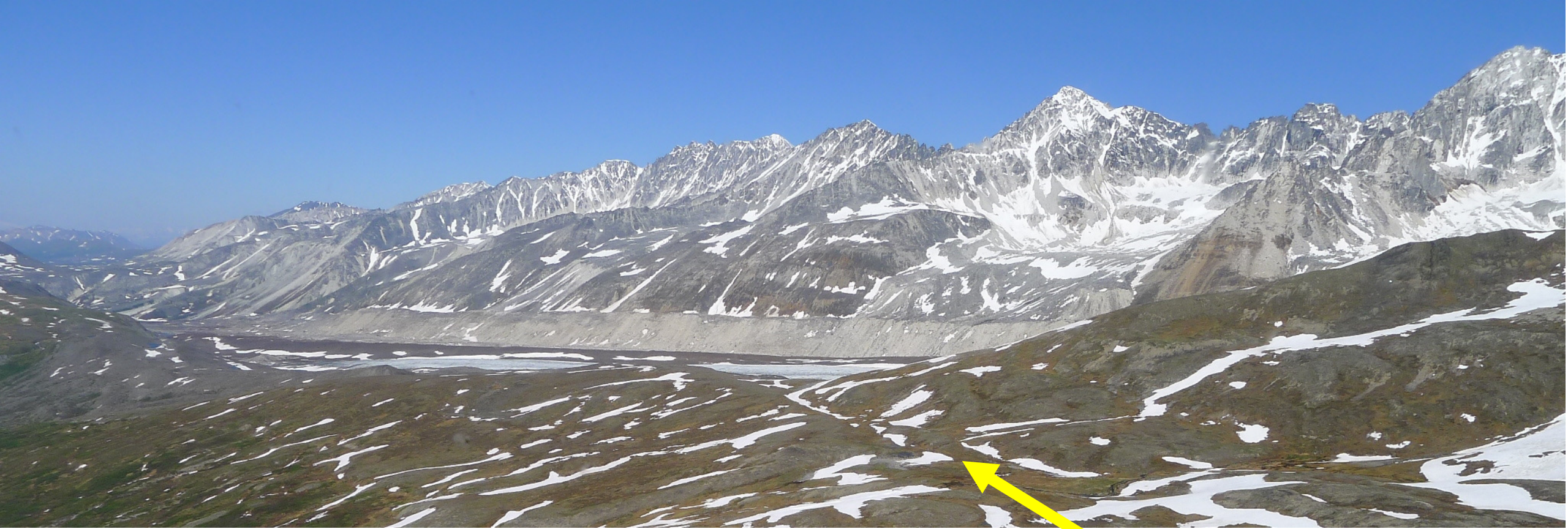


Slope map

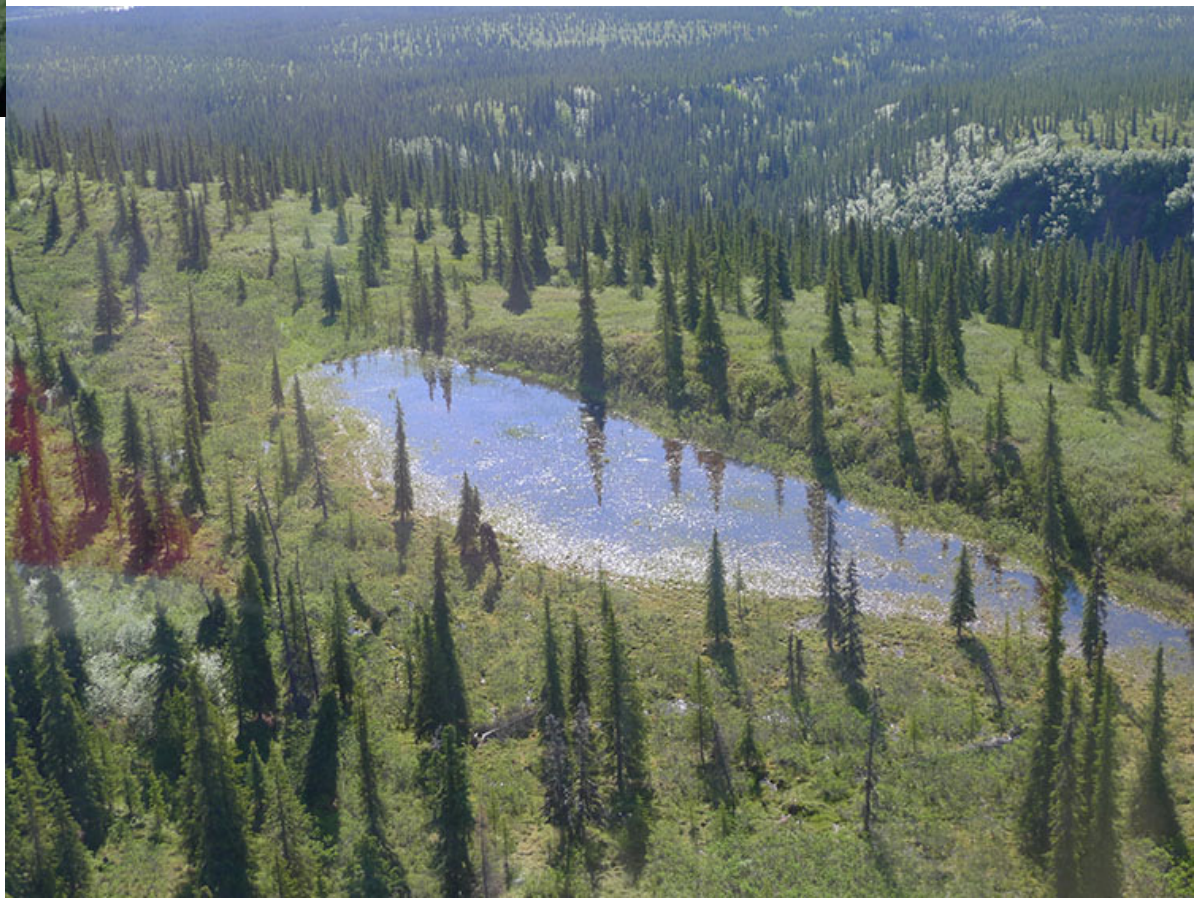


1:24,000 scale air photo

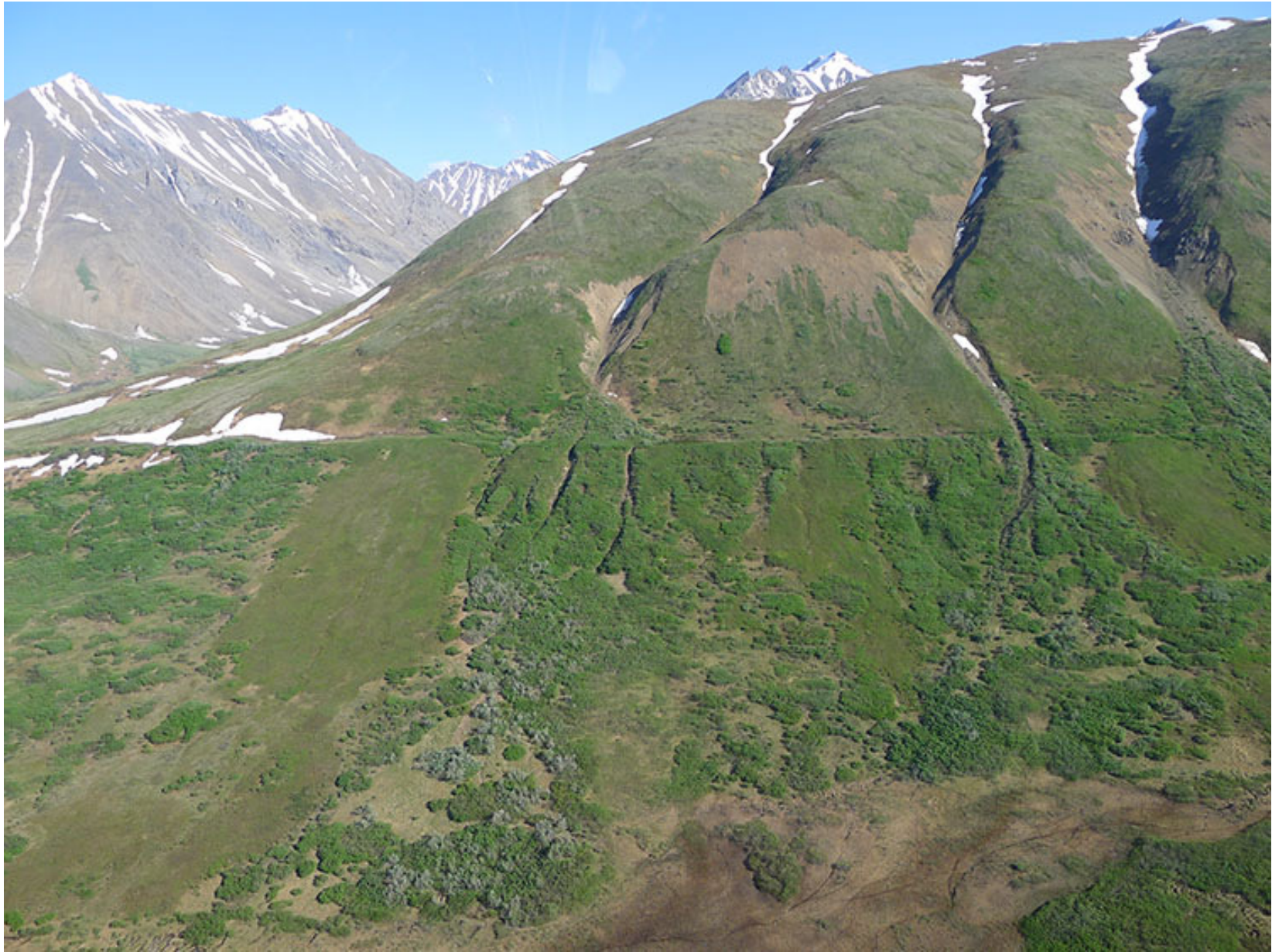
# Denali fault



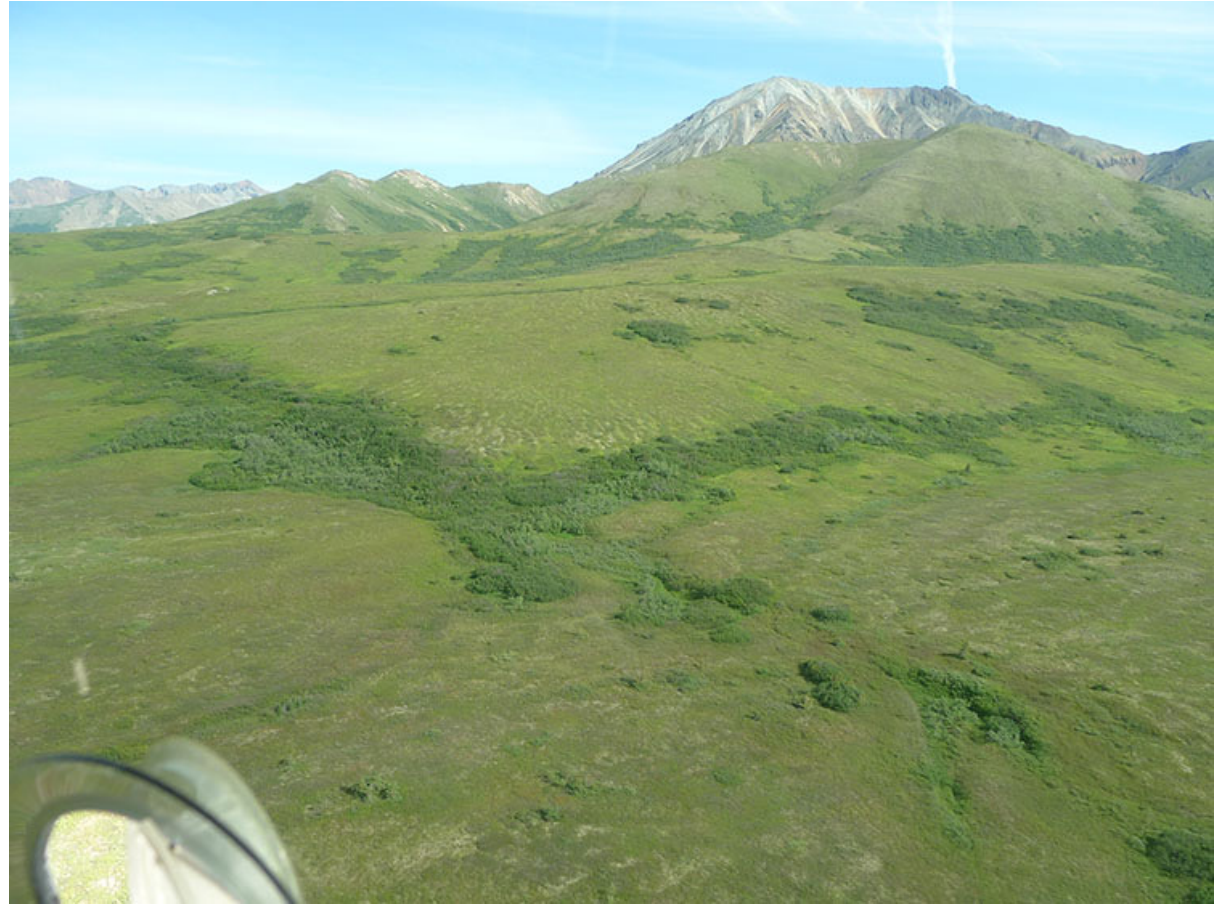
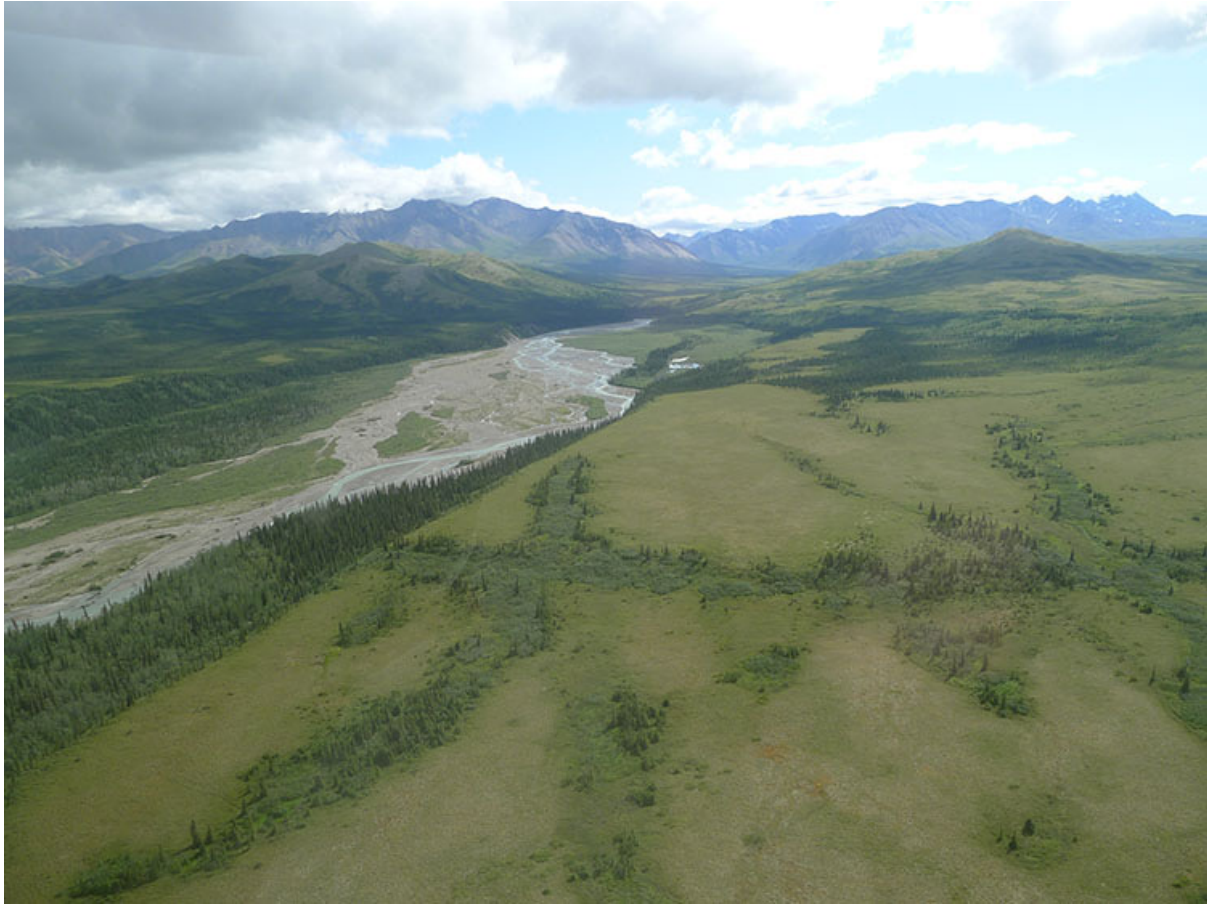
Linear trough cutting across glacially scoured bedrock saddle













# Denali fault, Parks Highway gas pipeline crossing

