

Final Technical Report
National Earthquake Hazards Reduction Program

Review of the map and descriptions of
Quaternary faults and folds in Nevada
compiled by the U.S. Geological Survey
Geologic Hazards Team, Golden, Colorado

by:

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General Comments and Procedure Followed

This fault compilation is a monumental effort and should result in a significant upgrade to local seismic hazard analyses and tectonic research in the Basin and Range Province. This compilation brings together into one place several important data sets on faults in Nevada, as well as the results of numerous individual and, in some cases, difficult to obtain studies. The opportunity for the Nevada Bureau of Mines and Geology to review the data set allowed us to gain a first-hand perspective of the data set, to help in the editing of the data, and to add information as appropriate, which I trust will further enhance the compilation.

I will give a brief summary of the types of comments made here, and the detailed comments follow, indexed by fault number and data entry section. The data sets were given to me by 1° x 2° quadrangle maps, beginning at the top of the state, and this review follows that order. Many comments I realize are format errors and likely existed because rawer forms of data entries, not the final format, was sent for timeliness. The natural process of completing the data entry will satisfy these edits. These include missing end-to-end lengths and average strikes. In addition, extraneous computer symbols remain in some of the final data sets. I noted these omissions and extraneous insertions to serve as a reminder that these data sets need to be completed or cleaned up.

Some of the comments are clarifications given to entries citing dePolo (1998). For example, where a I assigned a Type 2 slip rate of my classification system, many times it is stated that this is due to the "presence or absence of alluvial fault scarps and fault facets," when it can commonly more clearly stated based on the "presence of alluvial fault scarps and the absence of active basal fault facets." Also, rates determined by dePolo's (1998) method are explicitly "reconnaissance" fault slip rates, and the insertion of this term in most of the reported rates is advocated. The rates of Type 1 faults are over-precisely reported in the tables of dePolo (1998) because they were raw computer print-outs, clearly an error on my part. I advised the USGS a couple of years ago to only report a single significant figure from these data. Because these are reconnaissance slip rate estimations this is all that is warranted. Thus, where more than a single significant figure is reported for these faults I recommend reporting only one. Further, I recommend just taking the first value and not rounding up; this is because recent trenching data may indicate the lower end of the Type 1 fault slip rate estimations may be overestimating rates, therefore I feel we should not further increase the values.

The only fault entries that I felt needed significant additional information and are important enough that they should be worked on and resubmitted for NBMG review are the Yucca Mountain faults (Faults 1080 and 1081). This is one of the most studied fault systems on earth because of the proposed high-level nuclear waste repository which is moving towards a licensing process, and I suspect that the sheer mass of data, much of which is unpublished caused problems in compilation. Nevertheless, because society needs access to these data, these data entries need to be expanded. The primary request is that individual faults (e.g., Solitario fault) be given "section status" and discussed individually. This will allow for more detailed summaries of the

structural, geomorphic, and paleoseismic studies that were conducted along individual faults.

There are some missing faults that should be added to this data set to make it complete. This data set should supercede previous data sets. I feel that every fault scarp that was mapped in the Dohrenwend and others series of maps should be included; although most fault scarps are included, several are not. There may be some specific reasons not to include a fault scarp from this data set, such as a more detailed subsequent study that demonstrates that the feature was not a fault, but in most cases, there are no such studies. If a scarp is removed, it is usually part of a larger fault zone, and the removal based on a new study can be discussed there. This will be of use to consultants who are judging the seismic hazard potential, especially surface-rupture potential, of a site. In all other cases the scarps should be included in the new compilation. I have highlighted copies of Dohrenwend and others's maps indicating scarps that were not included and will mail these to Mike Machette of the survey. In addition, there are some other fault traces that I think should be added that I will give to Mike as well. They are noted in the comments in this report.

I have added some new faults; in some cases these are separated from larger fault groupings that seemed too large. I have written up at least two of these, but will follow up with the rest this summer. This was not part of the contract, thus the delay is inevitable as I try to make progress on my other funded projects. The faults I included are near Carson City and are a distinct urban threat.

I have put a tremendous amount of effort into this review, but nevertheless there is additional work to be done. For example, I haven't had time to contact former researchers of many faults to get their input, and this could be important in several cases. I recommend that the Nevada Bureau of Mines and Geology adopt the policy of collecting edits and additions to the data sets for Nevada and submitting these to the USGS for incorporation into the data set every two years. This does not supplant individuals submitting changes or additions to the USGS directly, rather it causes the Bureau to focus every two years on making sure the data set is kept current, and will give a certain priority to keeping the Nevada data current by the USGS. This is all in the spirit of having the best data available for Nevada's citizenry and professionals to use.

Dr. Price also is very interested in co-publishing a fault map of the State of Nevada with the USGS. This is a major product missing from the Bureau's seismic hazard publications and has had me trying to put together a Quaternary fault map of Nevada for years. I've advised him that this compilation would be the most logical to publish because it is the best Quaternary fault map of Nevada, period! Thus, he would like to pursue co-publishing this map. If this sounds like a good idea, please contact Dr. Price or me.

Comments on data entries for the **Vya Quadrangle**

Fault 826

length and average strike are missing

Fault 827

length and average strike are missing in all sections

Fault 827c, section name

Insert, "(fault V3 of dePolo, 1998)" at the end of the last sentence of the comments.

Fault 827c, slip-rate category

Change third sentence in comments to "dePolo (1998 #2845) estimated a reconnaissance vertical slip rate of 0.001 mm/yr for the fault section in Nevada (fault V3 of dePolo) based on the absence of fault scarps on alluvium and active basal fault facets."

Fault 856f, slip-rate category

The second sentence in the comments can be more accurately stated. Replace with, "For the Oregon portion of this section, dePolo (1998 #2845) assigned a reconnaissance vertical slip rate of 0.3 mm/yr based on an empirical relationship between his preferred maximum basal fault facet height and vertical slip rate."

Fault 1463, slip-rate category

The limit of fault slip rate "from height of topographic escarpments on Tertiary basalt" is a little vague; add height in parentheses following the word "basalt"; "(up to 70 to 130 m)."

Fault 1464, slip-rate category

The first sentence in the comments can be more accurately stated. Replace with, "dePolo (1998 #2845) reported a reconnaissance vertical fault slip rate of 0.001 mm/yr for the fault based on the lack of alluvial fault scarps and active basal fault facets."

Fault 1465, slip-rate category

The limit of fault slip rate “from height of topographic escarpments on Tertiary basalt” is a little vague; add height in parentheses following “basalt”; insert “(up to 250 m).”

Fault 1466, slip-rate category

The first sentence in the comments can be more accurately stated. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical fault slip rate of 0.001 mm/yr for the fault based on the lack of alluvial fault scarps and active basal fault facets.”

Fault 1472, slip-rate category

In the first sentence, insert the word “reconnaissance” before the first “vertical slip rate”.

Fault 1472, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.2 mm/yr”.

Fault 1481, geologic setting

First sentence beyond the semi-colon, the word “Canyon” is misspelled “Ca_on”.

Fault 1482, geomorphic expression

There are several observations of geomorphic features that are not referenced; for example, who observed topographic escarpments, aligned hillside benches, and the possible influence of the pattern of the local drainage system? Was this Ach, Dohrenwend and Moring, or Sawyer?

Fault 1485, synopsis

The evidence from Dodge’s trenching study indicates that interseismic intervals are not uniform along the Black Rock fault zone, and this should be indicated. Note that if the interval between the most recent and penultimate events is 5 ky (max allowed if MRE was immediately prehistoric and the penultimate was near the maximum age of 5 ka), then the intervals between the penultimate and the preceding event, and the preceding event and the event before than must be

at least 9 kyr if they were uniform intervals. This argument is based on extremes; more likely interpretations would make these differences larger. Thus, the statement about average recurrence intervals without any qualification in the face of the information at hand seems misleading.

I suggest adding an ending to the second sentence of the second paragraph in the synopsis following “yielding an average of 8 k.y. for the 3 associated recurrence intervals.”, such as, “, although the evidence indicates these were not regular interseismic intervals.” This will qualify this statement and draw attention to those with interests in variable interseismic intervals.

Fault 1485, name

Minor error in reference in fourth sentence; “Ramelli (1993 #2855)” should be “Ramelli and dePolo (1933 #2855)”.

Fault 1485, paleoseismology studies

Should add the primary reference for the ages of tephras given at the end of the first paragraph, even though this is a summary from Dodge. The primary reference is (Davis, 1978):

Davis, J.O., 1978, Quaternary tephrochronology of the Lake Lahontan area, Nevada and California: Nevada Archeological Survey Research Paper No. 7, Reno, Nevada, 137 p.

It would make this discussion a little clearer to give the original trench numbers in parentheses. For example, “Site 1485-1, North of Double Hot Springs.” could be modified to read, “Site 1485-1, North of Double Hot Springs (Dodge’s Trench 5).” The following are Dodge’s original Trench numbers

Site 1485-1	Dodge’s Trench 5
Site 1485-2	Dodge’s Trench 4A
Site 1485-3	Dodge’s Trench 4B
Site 1485-4	Dodge’s Trench 3
Site 1485-5	Dodge’s Trench 2
Site 1485-6	Dodge’s Trench 1

In my read of the trench description by Dodge for Site 1485-5, the offset of >4 m is based on relationships exposed in trenching and did not include hand auguring; thus I’d modify the last sentence of the paragraph on Site 1485-5 to read “... >4 m based on relationships exposed in trenching” and drop the last three words, “and hand auguring”.

I would add a sentence to Site 1485-6 that describes additional information reported by Dodge in

her discussion of this trench site. I would add at the end of the paragraph, “Locally a vertical offset of 4 m of the Marble Bluff tephra bed (~35 ka) was determined by hand auguring.”

Fault 1485, geomorphic expression

The last sentence can be worded more accurately. Replace with, “dePolo (1998 #2845) reported basal fault facets as much as 171 to 207 m high along parts of the fault zone that front the northern Black Rock Range.”

Fault 1485, slip-rate category

The last sentence of the comments can be worded more accurately. Replace with, “ dePolo (1998 #2845) estimated a reconnaissance vertical slip rate of 0.2 mm/yr based on the maximum height of basal fault facets for the Black Rock fault zone.”

Fault 1488, slip-rate category

The first sentence of the comments can be more accurately stated. Replace with, “dePolo (1998 #2845) estimated a reconnaissance vertical slip rate of 0.01 mm/yr (0.003 to 0.07 mm/yr) for the range front fault bounding McGee Mountain and the east border of Rock Spring Table plateau based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1494a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1494a, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.3 mm/yr”.

Fault 1494b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1494b, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.2 mm/yr”.

Fault 1495a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1495a, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.2 mm/yr”.

Fault 1495b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1495b, slip-rate category

Second sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1496, slip-rate category

the first sentence in the comments can be more accurately stated. Replace with, “dePolo (1998 #2845) estimated a reconnaissance vertical slip rate of 0.01 mm/yr (0.003 to 0.07 mm/yr) for the Eastern Bilk Creek Mountains fault zone based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1498, geomorphic expression

In the second sentence, an “up to” should be inserted before the “61 to 98 m high”.

Fault 1498, slip-rate category

In the first sentence of the comments, the word “reconnaissance” should be inserted before the first “vertical slip rate”.

Fault 1501a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1501a, slip-rate category

In the first sentence of the comments, the word “reconnaissance” should be inserted before “vertical slip rate”.

Fault 1501b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1501b, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.2 mm/yr”.

Comments on data entries for the **McDermitt Quadrangle**

Fault 1505, average strike

The average strike computed by the GIS is misleading for this orthogonal set of faults. I recommend changing this to N53°E and N 18°W, and note it was determined by visual inspection of the map.

Fault 1506, synopsis and geomorphic expression

In these discussions “abrupt scarps” are mentioned. Are these abrupt *alluvial* scarps or abrupt *bedrock* scarps? This is worth annotating.

Fault 1507, length and average strike

Length and average strike are missing.

Fault 1507a, geomorphic expression

Is there a consistency to the echelon nature of the faults that can be reported? Right echelon stepping or left echelon stepping?

Fault 1507a, length and average strike

Length and average strike are missing.

Fault 1507 b, geomorphic expression

Replace the third sentence in the comments, “The largest fault facet along the range front range is 195 m (dePolo, 1998 #2845).” to “Basal fault facets are reported to be as much as 171 to 219 m high (dePolo, 1998 #2845).”

Fault 1507b, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.3 mm/yr”.

Fault 1507b, length and average strike

Length and average strike are missing.

Faults 1508, 1508a, 1508b, 1508c, length and average strike

Length and average strike are missing.

Fault 1508b, geomorphic expression and slip-rate category

Remove the discussion of fault facets and the reconnaissance slip-rate estimate from these sections that are referenced to dePolo (1998). The facet-height measurement and slip-rate estimate for the Santa Rosa Range fault system were made in fault section 1508c.

Fault 1508c, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.5 mm/yr”.

Fault 1509, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1510, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1513, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1514, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1516, geologic setting

It is probably worth noting that this horst is formed in Pleistocene alluvium. Add the words “in Pleistocene alluvium” between the words “...horst” and “approximately ...” in the geologic setting sentence.

Fault 1519, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1520, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1523, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1524, synopsis

Misspelled the word “consensus” in the fourth sentence.

Fault 1529, synopsis and geologic setting

The term “diverse strikes” for these faults seems a bit overstated. Could just state that there are two faults with strikes of $\sim N10^\circ W$ and $\sim N30^\circ W$, and a small swarm of faults striking $N 70^\circ$ to $90^\circ E$. The computer-generated average strike of $N30^\circ W$ only represents one of these faults and is misleading for the others.

Fault 1531, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1532, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip rate estimate of 0.001 mm/yr for the fault bounding the south side of Squaw Valley based on the absence of alluvial fault scarps and active basal facets, and 0.01 mm/yr for the fault bounding the southeast side of Sixmile Hill based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1533, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.1 mm/yr”.

Fault 1534, synopsis

It is stated that, “The fault is apparently expressed as a west-facing scarp.” What is the reference for this and should this be modified to an “alluvial west-facing scarp”? Coats (1987 #2861) only shows a fault in QTa and does not indicate a scarp.

Fault 1547, - general statement

This compilation has only partly captured what appears to be an important Quaternary fault bounding the west side of Duck Valley. Most of this fault exists in Idaho, but it and other faults of the group extend into Nevada. dePolo (1998) referred to this fault as the Western Duck Valley fault zone. The fault shows indirect evidence for Quaternary movement by the apparent ponding of sediments where the Owyhee River crosses the fault (east-central part of the 7 1/5' Juniper Basin SE Quad. and west-central part of the 7 1/5' Mountain View Lake Quad., both in Idaho). The Owyhee River shows a prominent meander belt on a flat Quaternary alluvial surface (Coats, 1987 #2861) on the hanging wall of the Western Duck Valley fault zone, and becomes a down-cutting river in a narrow gorge downstream on the footwall. Quaternary tectonism appears to be ponding this Quaternary alluvium, and the position of this tectonism indicates there was likely Quaternary normal dip-slip movement along the Western Duck Valley fault zone.

I think we should add a short dotted fault trace to indicate how this fault comes into Nevada. This would connect with one of the fault traces indicated in Fault 1547. This fault would correspond to Fault MD13 of dePolo (1998), the Western Duck Valley fault zone. No slip rate was indicated in dePolo (1998), and I am not aware of any specific studies or geomorphic information. Without information to the contrary, the fault would fall into your slowest slip-rate category, less than 0.2 mm/yr (as already indicated in Fault 1547).

Fault 1547, geologic setting

Although there is an orthogonal pattern to faults in this area, all the faults indicated in the compilation have northerly strikes. These faults have associated topographic expression, in contrast to the others in the orthogonal pattern. This dominance of strike should be added to the discussion. Add the sentence, "The faults portrayed here have the most notable topographic expression and all have northerly strikes."

Fault 1550, slip-rate category

The first sentence can be more accurately written. Replace with, "dePolo (1998 #2845) assigned a reconnaissance vertical slip rate of 0.001 mm/yr for the fault based on an absence of alluvial fault scarps and active basal fault facets."

Fault 1552, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, "dePolo (1998 #2845) reported a reconnaissance vertical slip rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets."

Fault 1553a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1553a, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.2 mm/yr”.

Fault 1553b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1553b, geomorphic expression and slip-rate category

As inferred in both of these sections the facet measurements for the Eastern Independence Valley fault zone were made along Fault 1553a. Therefore the last sentence in the geomorphic expression section and the first sentence in the slip-rate category section should be deleted.

Fault 1554, slip rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Comments on data entries for the Wells Quadrangle

Fault 1556a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1556a, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1556b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1556b, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1553c, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1561, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1562, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1568, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1571, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1572, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1578, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1579, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1582a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1582a, synopsis

The synopsis states twice, in the fourth and tenth sentences, that the sectioning of the fault zone was not addressed in any previous study. dePolo (1998) broke out these exact same sections, so this is not a true statement.

Fault 1582a, geomorphic expression

I've always worried these were relict facets. Because of the fault's position and the magnitude of the reconnaissance rate generated, insert, ", but these may be relict facets" following "146 m" in the last sentence.

Fault 1582a, slip-rate category

The first sentence should be modified to be more accurate. Insert the word "reconnaissance" before the first "vertical slip rate", and restrict the slip-rate estimate in the first sentence to the first, significant figure, "0.2 mm/yr".

Fault 1583, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, "dePolo (1998 #2845) reported a reconnaissance vertical slip rate estimate of 0.001 mm/yr based on the absence of alluvial fault scarps and active basal fault facets."

Fault 1584a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1584a, name

The name "Slemmons" is misspelled in the first sentence (slemons).

Fault 1584a, slip-rate category

The basal facet measurement was made in Fault 1584c, north of Thousand Springs Creek, in the northeast corner of the 7 ½' Wine Cup Ranch Quadrangle. Therefore it is not needed to be reported in Fault 1584a section which has different geomorphology. dePolo (1998) reported a single value for entire fault zones to represent faults with a single maximum rate. Deleting the reference to dePolo (1998) would help alleviate misunderstandings between the rate estimate and

this particular fault section. Therefore I recommend you delete the first two sentences of the comments section, remove the “However” from the beginning of the third sentence, insert the word “low” before the words “slip rate” in the third sentence, and delete “is of a lesser magnitude” from the end of the third sentence.

Fault 1584b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1584b, name

The name “Slemmons” is misspelled in the first sentence (slemons).

Fault 1584b, geomorphic expression

The basal facet measurement was made in Fault 1584c, north of Thousand Springs Creek, in the northeast corner of the 7 ½' Wine Cup Ranch Quadrangle. Therefore it is not needed to be reported in Fault 1584b section which has different geomorphology. dePolo (1998) reported a single value for entire fault zones to represent faults with a single maximum rate. Deleting the reference to dePolo (1998) from the geomorphic expression comments would help alleviate misunderstandings between the rate estimate and this particular fault section.

Fault 1584b, slip-rate category

The basal facet measurement was made in Fault 1584c, north of Thousand Springs Creek, in the northeast corner of the 7 ½' Wine Cup Ranch Quadrangle. Therefore it is not needed to be reported in Fault 1584b section which has different geomorphology. dePolo (1998) reported a single value for entire fault zones to represent faults with a single maximum rate. Deleting the reference to dePolo (1998) would help alleviate misunderstandings between the rate estimate and this particular fault section. Therefore I recommend you delete the first two sentences of the comments section, remove the “However” from the beginning of the third sentence, insert the word “low” before the words “slip rate” in the third sentence, and delete “is of a lesser magnitude” from the end of the third sentence.

Fault 1584c, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1584c, name

The name “Slemmons” is misspelled in the first sentence (slemons).

Fault 1584c, slip-rate category

Insert the word “reconnaissance” before the first “vertical slip rate” and limit the slip-rate estimate to one significant figure, “0.1 mm/yr”.

Fault 1589, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1592, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1596, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1597, synopsis and geologic setting

These discussions imply there is only one fault, whereas two are shown on the map. Need to add a sentence to each section that notes that a small group of faults to the south is also included within Fault 1597. This second fault appears to be alluded to in the discussion under “Name”.

Fault 1597, most recent prehistoric deformation (ka)

Discussions on recurrence interval and slip-rate category have been accidentally included this section.

Fault 1597, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.001 mm/yr based on the absence of alluvial fault scarps and active basal fault facets.”

Fault 1599a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1599a, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1599b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1599b, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Comments on data entries for the **Lovelock Quadrangle**

Fault 1601, synopsis and geologic setting

The low basalt hills bounded by the Bonham Ranch fault zone is not “in the center” of the Smoke Creek Desert as noted in the third sentences. Replacing this with “in the western part of “ or something similar would be more accurate.

Fault 1601, geomorphic expression

The last sentence can be more accurately written. Replace with, “The maximum height of basal facets is reported between 128 and 207 m (dePolo, 1998 #2845).”

Fault 1601, slip-rate category

The third sentence can be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the third sentence to a single significant figure, “0.3 mm/yr”.

Fault 1602, geomorphic expression

The third sentence can be modified to be more accurate by inserting “up to” in place of “from” before the values, and removing “heights” and inserting high following the values (“Basal facet are up to 165m to 189 m high ...”).

Fault 1602, slip-rate category

The first sentence can be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to a single, significant figure, “0.3 mm/yr”.

Fault 1604, slip rate category

Upon reading this summary and realizing that Quaternary alluvial fault scarps exist along the piedmont fault, I recommend modifying the estimate of dePolo (1998) to reflect this. Thus, I recommend replacing the first sentence with, “dePolo (1998 #2845) assigned a reconnaissance vertical slip rate of 0.001 mm/yr based on the absence of alluvial fault scarps and basal fault facets. With the recognition of alluvial fault scarps along this fault, a reconnaissance vertical slip

rate of 0.01 mm/yr would be more consistent with dePolo's procedure."

Fault 1607a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1607a, geomorphic expression

Yes the basal facets were measured along this section, therefore the "presumably measured along this section" at the end of the second sentence can be deleted.

Fault 1607a, slip-rate category

There is an extraneous "0.609" at the beginning of the comments that should be deleted. The first sentence can be modified to be more accurate. Insert the word "reconnaissance" before the first "vertical slip rate", and restrict the slip-rate estimate in the first sentence to a single, significant figure, "0.6 mm/yr".

I recommend keeping the Eastern Pyramid Lake fault in the <0.2 mm/yr category because it is not clear the fault has large Holocene offsets along it, and until further study, the reconnaissance value does not warrant making changes in the NEHRP data set at this time, which is a consequence of the assigned slip-rate category.

Fault 1607b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1607b, geomorphic expression and slip-rate category

The facet height measurement and reconnaissance slip rate estimate were made along the northern section, therefore the discussion on fault facets in the geomorphic expression section (second sentence), and the discussion about the reconnaissance vertical slip rate in the slip-rate category comments (first, second, and first half of the third sentences) should be deleted.

Fault 1608, geomorphic expression

There are two references that on fault scarps along the Fox Range fault zone (Fault 1608) that should be included in this discussion. A possible sentence that could be inserted following the first sentence in the discussion is, "Inghram and others (1980) measured seven scarp profiles along the northern half of the Fox Range fault zone; they measured a maximum vertical displacement of 2.5 m, and maximum scarp angles of 20° to 30°."

The reference for Inghram and others (1980) is:

Inghram, B.J., Klimberg, D.M., and Metcalf, L.A., 1980, The Fox Range fault scarp: age determination by soil cohesion and Wallace methods, in Proceedings of the eighteenth annual engineering geology and soils engineering symposium: Sponsored by the Idaho Department of Transportation, p. 99-113.

The second sentence in the current discussion can be rewritten to be more accurate. Replace with, "Basal fault facets are up to 183 to 232 m high along the front of the Fox Range (dePolo, 1998 #2845)."

Fault 1608, most recent prehistoric deformation (ka)

There are two references that should be included in this section even though they are somewhat dated and use old scarp morphologic techniques. These are Inghram and others (1980), and Bell and Slemmons (1982). A possible sentence to add to this section is, "Two estimates of the most-recent event along the northern part of the Fox Range fault zone have been made based on scarp morphology. Inghram and others (1980) estimate that the most-recent event is 2000 ybp using the Wallace method, and greater than a few hundred years using a soil-cohesion method; they conclude the most recent event is 500 to 1000 ybp. Bell and Slemmons (1982) indicate that two Holocene events have occurred along the northern Fox Range fault zone based on scarp morphology and geomorphic expression of faults in post-Lahontan sediments, with the most recent event occurring within the last 3000 years. Bell and Slemmons (1982) indicate that the most recent event along the southern Fox Range fault zone is pre-Lahontan (late Pleistocene?)."

You may wish to add some qualifications about the probable crudeness of these scarp-slope degradation methods in their early usage - I leave that up to you.

The reference for Bell and Slemmons (1982) is:

Bell, E.J., and Slemmons, D.B., 1982, Tectonic activity in the Smoke Creek Desert, northwestern Nevada: Geological Society of America, Cordilleran Section Meeting, v. 14, p. 148-149.

Fault 1608, sense of movement

Add the following sentence to the comments, "Bell and Slemmons (1982) indicate there is a possible right-lateral component in addition to the normal component along frontal faults of the Fox Range."

Fault 1608, slip-rate category

The first sentence can be modified to be more accurate. Insert the word "reconnaissance" before the first "vertical slip rate", and restrict the reconnaissance slip-rate estimate in the first sentence to a single, significant figure, "0.3 mm/yr".

Fault 1610, slip-rate category

The first sentence can be modified to be more accurate. Insert the word "reconnaissance" before the first "vertical slip rate". Restrict the slip-rate estimate in the first sentence to two significant figures, "1.5 mm/yr".

Fault 1611, slip-rate category

dePolo (1998) made reconnaissance slip-rate estimations for the Eastern Granite Range fault and because these are reported for most of the other faults, they might as well be reported here. Add to the comments, "dePolo (1998 #2845) assigned a reconnaissance vertical slip rate of 0.1 mm/yr along the northern part of the Granite Range fault and 0.3 mm/yr for the southern part based on an empirical relationship between his preferred maximum basal facet height and vertical slip rate. The size of the facets (tens to hundreds of meters, as measured from topographic maps) indicates they are the result of many seismic cycles, and thus the derived slip rate reflects a long-term average. However, the late Quaternary characteristics of this fault (overall geomorphic expression, continuity of scarps, age of faulted deposits, etc.) suggest the slip rate during this period is of a slightly lesser magnitude." Note this is written with the general party line of other fault entries - I more or less ghost-wrote this for Tom Sawyer. I have some further research to do (partly prompted by recent USGS trenching studies in Nevada) before I can weigh in on the above argument.

Fault 1612, slip-rate category

Insert the word "reconnaissance" before the first "vertical slip rate" in the first sentence, and restrict the estimate to the first significant figure of dePolo (1998), "0.4 mm/yr".

Fault 1613, slip-rate category

The first sentence can be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first significant figure, “0.4 mm/yr”.

Fault 1614, geomorphic expression

Modify the second sentence slightly to say, “...basal facets are as much as 165 to 189 m high along ...” in place of what is there.

Fault 1614, slip-rate category

The first sentence can be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to a single significant figure, “0.3 mm/yr”.

Fault 1617, geomorphic expression

Insert the words, “as much as” in the second sentence after the words “fault facets”. I would also use the word “to” between the range values rather than the hyphen.

Fault 1617, slip-rate category

The first sentence can be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to a single, significant figure, “0.4 mm/yr”.

Fault 1618, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1619, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1622, slip-rate category

The first sentence can be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to a single, significant figure, “0.5 mm/yr”.

Fault 1624, slip-rate category

The first sentence can be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to a single, significant figure, “0.2 mm/yr”.

Fault 1626, slip-rate category

The first sentence can be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to a single, significant figure, “0.2 mm/yr”.

Fault 1627, slip-rate category

The first sentence can be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to a single, significant figure, “0.2 mm/yr”.

Fault 1629, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1634, geomorphic expression

dePolo (1998) estimated heights of basal facets along Fault 1634. Add the following sentence to the discussion, “dePolo (1998 #2845) reported maximum basal facets up to 183 to 232 m high along the western front of the Eugene Mountains.”

Fault 1634, slip-rate category

The reported slip-rate value from dePolo (1998) has been rounded up. I am restricting the number of significant figures of these estimates to eliminate the over-precision left unedited in dePolo (1998). Therefore, the first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, significant figure, “0.3 mm/yr”.

Fault 1635a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1635a, name

Minor edit; in the third sentence fault is spelled “faulty”; remove the “y”.

Fault 1635a, geomorphic expression

In the sixth sentence on fault facets can be more accurately written. Replace the sentence with, “Scarps at the bedrock-alluvium contact exhibit oversteepened slopes at the base of the range, and basal fault facets up to 146 to 195 m high.”

Fault 1635a, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to a single significant figure, “0.3 mm/yr”.

Fault 1635b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1635b, name

Minor edit; in the third sentence fault is spelled “faulty”; remove the “y”.

Fault 1635b, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to a single significant figure, “0.2 mm/yr”.

Fault 1636, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to a single significant figure, “0.2 mm/yr”. Note, the value given in the review copy was rounded up and I’ve corrected this.

Fault 1637, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Comments on data entries for the **Winnemucca Quadrangle**

Fault 1134, synopsis and geologic setting

The structural depth of the basin adjacent to the Dunn Glenn fault is mentioned as a characterizing factor of this fault (of moderate size). Estimates of the Cenozoic basin fill exist (Jachens and Moring (1990)) and can be used as a surrogate for basin depth to indicate a magnitude of basin offset. In the case of the west side of the Dunn Glenn fault, the estimate would be 0.5 to 1 km of Cenozoic basin fill.

Fault 1134, geomorphic expression

The uncertainty in the facet height measurement should be indicated. Add “(110 to 158 m)” to the end of the third sentence on facet heights.

Fault 1134, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, significant figure, “0.2 mm/yr”.

Fault 1135, average strike (°)

Although N0°E is the strike of a small portion of the fault zone near the southernmost end, most of the central portion has strikes of N~17° to ~22°W. The computer average strike is misleading and a range of strike should be inserted.

Fault 1135, paleoseismology studies

Were any single-event displacements measurable in the trench? If so, this would be important information to include in the write up.

Missing reference for 6.8 ka age of Mazama ash in second-to-last sentence.

It seems a bit like Wallace’s (1979) estimate of ~12 ka age for the most-recent event along the Grass Valley fault zone and Pearthree’s work should be in the paleoseismology section - just a comment - I realize this is a style of format question - so I just make the comment for you to consider.

Fault 1135, geomorphic expression

The uncertainty in facet height measurement should be indicated. Insert "(73 to 122 m)" following the "98 m" in the last sentence.

Fault 1135, most recent prehistoric deformation (ka)

The last statement summarizing Pearthree's results was not finished. Pearthree concluded, "Scarp profiles collected along the mountain front and along a fault strand that trends out into the basin at Leach Hot Springs indicate a scarp age of 13 to 30 ka." for the Grass Valley fault zone. I know Phil and Julia Fonseca did more work than I have access to. They had soil pits on different surfaces, Oliver Chadwick describing soils, the rest of us doing scarp profiles of different abandoned surfaces.

Fault 1135, slip-rate category

The first sentence should be modified to be more accurate. Insert the word "reconnaissance" before the first "vertical slip rate", and restrict the slip-rate estimate in the first sentence to the first, significant figure, "0.1 mm/yr".

Fault 1136a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1136a, geomorphic expression

There is the interpretation in this write up (both geomorphic expression and geologic setting) that because the 1915 surface rupture was up-slope in places from the base of the escarpment, it is not related to the main fault that can be geomorphically mapped along the base. It is commented that this may be a newly established fault precluding a block-bounding nature. I believe that although much of this rupture in the southern part is clearly up in the range, the northern part where the facets are is likely the main fault at the base either rupturing up the colluvial slope or rupturing a secondary fault that likely merges at shallow depth with the main fault; in other words the main fault along the northern part of the northwestern China Mountain escarpment fault is still Quaternary active and parts of it moved in 1915 in the subsurface. To be clear, this main fault did not rupture at the surface in 1915, and the rupture along the slope that occurred in 1915 apparently ruptured similarly during a prior event (Wallace's subdued scarp). I asked Dr. Robert Wallace his opinion on the matter and he professed without provocation that he felt the 1915 break was probably a small gravity feature, that in cross section would be a branch or secondary

fault that merges with the main fault below. He also noted that at several places along the 1915 surface break the rupture trends up in the range. I proceed through this diatribe because there is a certain sense in examining geomorphic features along the main, basal fault even though that fault did not rupture in 1915. The facets which were used are along the northeastern portion of the 1915 break, just northeast of section 33, T32N, R40E. Here the 1915 break is about 50 meters up the slope, but actually merges northeast and southwest of this stretch with the main fault where it climbs over the bedrock highs on the down-faulted side. Here I've mapped a few basal facets that are 100 to 134 m high from the base fault, and connecting these with a tectonic trim line projected to the northeast, include an eroded facet bounding a protruding ridge (sort of a messy spur ridge) that is about 158 m in height. This was used as maximum basal facet height, and for a lower uncertainty, the 134 m high facet was used.

Thus, I would modify the second-to-last sentence, deleting the text following "158 m," and inserting, "but this measurement was made along the main range-front fault and not from the 1915 break." I would delete the last sentence of this section. If you want to keep the last sentence, extract part of the above discussion to give my viewpoint on the matter.

Fault 1136a, slip rate category

Without specifically defending the rate (I need to review the methodology and the measurements), I disagree with the portrayal that the reconnaissance estimated is unrelated to the China Mountain fault in the forth and fifth sentences for reasoning laid out previously. Either just report the rate or I'll have insert a paragraph illustrating the counter viewpoint. I would replace the forth and fifth sentences with, "dePolo (1998 #2845) estimated a reconnaissance vertical slip rate of 0.2 mm/yr for the China Mountain fault based on an empirical relationship between vertical slip rate and maximum basal facet height."

Fault 1136b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1136b, paleoseismology studies

Are there any single-event offsets from the MRE or penultimate event that can be reported from this trenching?

Fault 1136b, geomorphic expression

The uncertainty in facet height measurement should be indicated. Insert "(171 to 195 m)"

following “183 m” in the fourth sentence.

Fault 1136b, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, significant figure, “0.3 mm/yr”.

Fault 1136c, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1136c, paleoseismology studies

Are there any single-event offsets from the MRE or penultimate event that can be reported from this trenching?

Fault 1136c, geomorphic expression

Add, “dePolo (1998 #2845) reported that basal facets are as much as 207 m (183 to 232 m) high.”

Fault 1136c, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, significant figure, “0.3 mm/yr”.

Fault 1136d, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1136d, geomorphic expression

Add, “dePolo (1998 #2845) reported that basal facets are as much as 85 m (61 to 110 m) high.”

Fault 1136d, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, significant figure, “0.1 mm/yr”.

Fault 1137, synopsis

I re-looked at this fault and decided that I need to revise my estimates. My original estimates were based on eroded facets that reached a tectonic trim line at around 100 m above the fault. The overall nature of the range front on topographic maps does appear somewhat inactive as indicated in the write up, but there still are some basal facets (albeit not a lot) that I can't entirely discount. I would now estimate a basal facet height of 61 m, with a range of 0 to 91 m (zero meaning no active basal facets, and 91 m being the height of another candidate facet that reaches a tectonic trim line). The 61-m facet is located at T.33N., R.40S., w-central part of section 5, just north of the hot springs along the range. The 91-m is in the northeastern part of section 5 in the same township and range. The corresponding reconnaissance vertical slip rate estimates would be 0.1 mm/yr (0.01 to 0.1 mm/yr). I accept the consistent caveat that you think these would be long-term rates at best and think the rate is lower. In light of recent trench results I have to review the procedure and rates assigned for faults with 0.01 to 0.1s mm/yr before I can comment.

Replace the last sentence with, “A maximum basal facet height of 61 m has been estimated, but these may be relict in nature (modified from dePolo 1998).”

Fault 1137, geomorphic expression

Following on the discussion in “Fault 1137, synopsis” replace the last sentence with, “dePolo (modified from 1998 #2845) reports possible basal facets that are up to 61 m (0 to 91 m) in the central part of the fault, south of Goldrun Creek, just north of the hot springs along the fault. Facets are generally eroded and compound in nature, and are discontinuously scattered along only the central portion of the fault”

Fault 1137, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, significant figure, “0.2 mm/yr”.

Fault 1139, geomorphic expression

The uncertainty of the facet-height measurement should be indicated. Insert "(171 to 195 m)" following the "183 m" in the last sentence.

Fault 1139, slip-rate category

The first sentence should be modified to be more accurate. Insert the word "reconnaissance" before the first "vertical slip rate", and restrict the slip-rate estimate in the first sentence to the first, significant figure, "0.3 mm/yr".

Fault 1140, geomorphic expression

The uncertainty of the facet-height measurement should be indicated. Insert "(219 to 268 m)" following the "244 m" in the third sentence.

Fault 1140, map

The main fault should be "orange" not "black"; see section on most recent prehistoric deformation.

Fault 1140, slip-rate category

The first sentence should be modified to be more accurate. Insert the word "reconnaissance" before the first "vertical slip rate", and restrict the slip-rate estimate in the first sentence to the first, significant figure, "0.4 mm/yr".

Fault 1142, geomorphic expression

The maximum basal facet measurement of dePolo (1998) was made immediately north of Mill Creek. The uncertainty of the measurement should be indicated as well as the location given the discussion that exists. The uncertainty should be at least a little lower to probably 110 m for the facet immediately south of Mill Creek, considering the facet north of the creek is compound. The 60-m high facets that caught Ernie Anderson's eye are of interest to me as well. In trying to do the whole state at once, I did not spend enough time per fault. Consequently my uncertainties should have been much larger - mostly on the lower part of the range. Facets do not exist ubiquitously along faults, and only a handful of sections of faults can truly be characterized as having continuous facets. I was going to give a fairly lengthy response to insert responding to

some of these comments, but Ernie makes some good points and I'll respond after doing a little more research.

For the time being, add the uncertainty of "(110 to 171 m)" following "146 m" in the third sentence. Insert "The maximum basal facet measurement reported by dePolo (1998 #2845) was made immediately north of Mill Creek." following the third sentence.

Fault 1142, slip-rate category

The first sentence should be modified to be more accurate. Insert the word "reconnaissance" before the first "vertical slip rate", and restrict the slip-rate estimate in the first sentence to the first, significant figure, "0.2 mm/yr".

Fault 1143, slip-rate category

dePolo (1998) has a reconnaissance slip rate estimate for the Eastern Battle Mountain faults can be reported. Add "dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets." to the comments.

Fault 1144a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1144a, synopsis

The sentence reporting slip rates from dePolo (1998) can be more accurately stated. Insert the word "reconnaissance" before slip rates in the eighth sentence, and restrict the slip-rate estimate to the first, significant figures and add the units, "0.3 and 0.2 mm/yr".

Fault 1144a, slip-rate category

The first sentence should be modified to be more accurate. Insert the word "reconnaissance" before the first "vertical slip rate", and restrict the slip-rate estimate in the first sentence to the first, significant figure, "0.3 mm/yr".

Fault 1144b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1144b, synopsis

The sentence reporting slip rates from dePolo (1998) can be more accurately stated. Insert the word “reconnaissance” before “slip rates” in the eighth sentence, and restrict the slip rate estimate to the first, significant figure and add the units, “0.3 and 0.2 mm/yr”.

Fault 1144b, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, significant figure, “0.2 mm/yr”.

Fault 1146, synopsis

The sentence reporting slip rates from dePolo (1998) can be more accurately stated. Insert the word “reconnaissance” before “vertical slip rates” in the tenth sentence, and restrict the slip rate estimate to the first, significant figure, “0.1”.

Fault 1146, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, significant figure, “0.1 mm/yr”.

Fault 1147, slip-rate category

dePolo (1998) has a reconnaissance slip rate estimate for the Southeast Fish Creek Mountains fault that can be reported. Add “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.” to the comments.

Fault 1148a, map

Check for additional fault traces on the NBMG geologic maps of the Argenta, Stony Point, and Bateman Spring Quadrangles supplied with report to Machette.

Fault 1148a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1148a, geomorphic expression

Add the uncertainty in the facet measurement. Insert "(110 to 207 m)" following the "183 m" in the sixth sentence.

Fault 1148a, slip-rate category

The first sentence should be modified to be more accurate. Insert the word "reconnaissance" before the first "vertical slip rate", and restrict the slip-rate estimate in the first sentence to the first, significant figure, "0.3 mm/yr".

Fault 1148b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1148b, geomorphic expression and slip-rate category

Yes it is true as surmised that the facet measurement was made along the "northern section." Therefore the discussion of facet height and reconnaissance slip rate can be removed from this fault section's discussions. Delete the eighth and ninth sentences of the geomorphic expression and the first and second sentences in the comments of the slip-rate category.

Fault 1148, map

The fault should be "orange" on the map; see the existing paleoseismology section.

Fault 1149, map

The are additional fault traces on the NBMG geologic maps of the Battle Mountain and Stony Point Quadrangles (supplied with this report to Machette) that should be added to the USGS compilation. Additionally some fault traces along the southern part of the zone should be colored orange (offset Qay2 deposits).

Fault 1149, most recent prehistoric deformation (ka)

There are some fault traces that have (<15 ka) offsets on the southern part of this zone as mapped on the NBMG Stony Point and Battle Mountain Quadrangles that should be mentioned.

Fault 1149, slip-rate category

The first sentence should be modified to be more accurate. Insert the word "reconnaissance" before the first "vertical slip rate", and restrict the slip-rate estimate in the first sentence to the first, significant figure, "0.1 mm/yr".

Fault 1150, map

The short section show at the northern part of the Argenta Quadrangle (House and others, 2001) should be shown as orange (<15 ka). I'll supply a quad. (NBMG OFR 2000-7). Check the traces of this map and Ramelli and others (2001) (NBMG Map 131) with the USGS map and include any missing ones. It is hard to tell visually between the USGS map and these maps. Note on the Stony Point and Battle Mountain Quadrangles (Ramelli and others, 2001, and House and others, 2001) there is a questioned fault trace that crosses and controls the Humboldt River. This should be included as a questioned, orange (<15 ka) fault trace.

Fault 1150, geomorphic expression

I do believe that there are a series of facets down the range front, but they may all be compound in nature. Thus, although a possible maximum rate might be estimated from the 213 m height, it is equivocal whether these are active basal facets; there are alluvial fault scarps along the fault, however. I feel somewhat compelled, but not compelled enough to take on some of the sentences in this section. I'll study this fault further and comment later.

Fault 1150, most recent prehistoric deformation (ka)

House and others (2001) show Holocene offset along a small portion of this fault zone (see map - offset Qay in one area near the top).

Fault 1150, slip-rate category

Because I have some reservation about this measurement (as mentioned above) and concerns about the estimation technique in this range of estimate, I would assign this fault to the category of "less than 0.2 mm/yr". Although there is a Holocene rupture along this fault there is not enough additional evidence for the higher slip rate category. The last sentence in the section can be deleted or modified to reflect assigning this category.

The first sentence should be modified to be more accurate. Insert the word "reconnaissance" before the first "vertical slip rate", and restrict the slip-rate estimate in the first sentence to the first, significant figure, "0.4 mm/yr".

Fault 1151, slip-rate category

The first sentence should be modified to be more accurate. Insert the word "reconnaissance" before the first "vertical slip rate", and restrict the slip-rate estimate in the first sentence to the first, significant figure, "0.2 mm/yr".

Fault 1153, slip-rate category

The first sentence should be modified to be more accurate. Insert the word "reconnaissance" before the first "vertical slip rate", and restrict the slip-rate estimate in the first sentence to the first, significant figure, "0.1 mm/yr".

Fault 1154, slip-rate category

The first sentence can be more accurately stated. Insert, "an absence of alluvial fault scarps and active basal facets" following "based on" replacing the existing text.

Fault 1155, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimates in the first sentence to the first, significant figures, “0.3, 0.2, and 0.2 mm/yr”.

Fault 1156, slip-rate category

dePolo (1998) has a reconnaissance slip rate estimate for the Crescent Valley faults that can be reported. Add “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.” to the comments.

Fault 1157a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1157a, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, significant figure, “0.2 mm/yr”.

Fault 1157b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1157b, geomorphic expression

dePolo (1998) made a facet measurement along the Cortez Mountain fault zone that can be reported. Add, “dePolo (1998 #2845) measured a maximum basal facet height of 232 m (110 to 250 m) along the Cortez Mountain fault zone.”

Fault 1157b, slip-rate category

The second sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the

first, significant figure, “0.2 mm/yr”.

Fault 1157c, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1157c, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, significant figure, “0.2 mm/yr”.

Fault 1158, synopsis

The last sentence questions the geomorphic expression of the fault on the basis of the lack of offset of Tertiary rocks that cross the western projection of the fault. It is possible, especially given the erosional pattern of the piedmont, that a tear fault accommodates a step to the north in this area, although this is not mapped. With this said the large facet is unusual and perhaps is a compound facet.

Fault 1158 slip-rate category

Because I have some reservation about this measurement (as mentioned above) and concerns about the estimation technique in this range of estimate, I would assign this fault to the category of “less than 0.2 mm/yr”. Delete the last sentence of the comments.

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, significant figure, “0.4 mm/yr”.

Fault 1160a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1160a, slip-rate category

dePolo (1998) has a reconnaissance slip rate estimate for the Pinon Range fault zone that can be reported. Add “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.” to the comments.

Fault 1160b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1160b, slip-rate category

dePolo (1998) has a reconnaissance slip rate estimate for the Pinon Range fault zone that can be reported. Add “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.” to the comments.

Fault 1161, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, significant figure, “0.2 mm/yr”.

Fault 1164, map

I could not find this fault on the map. Either I missed it, it is not on the map, or it may be portrayed as Fault 1144a.

Fault 1178a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1178a, synopsis

At the end of the fourth sentence, do you mean “Grass Valley” instead of “Crescent Valley”?

At the end of the seventh sentence, do you mean “Cortez Mountain fault zone [1157]” instead of “Crescent Valley fault [1608]”?

Fault 1638, most-recent prehistoric deformation (ka)

A estimate of scarp age by Hanks and Wallace (1985) should be included. Insert following the second sentence, “Hanks and Wallace (1985 #____) estimate the age of the most-recent event along what they term the “Beachfront fault scarps” as being 15 to 18 ka based on diffusion modeling of fault scarps.

Hanks, T.C. and Wallace, R.E., 1985, Morphological analysis of the Lake Lahontan shoreline and Beachfront fault scarps, Pershing County, Nevada: Bulletin of the Seismological Society of America, v. 75, p. 835-846.

Fault 1638, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.1 and 0.1 mm/yr” and “0.2 mm/yr”.

Comments on data entries for the **Elko Quadrangle**

Fault 1573a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1573a, name

In the fifth sentence delete the “has” following “Ruby Mountains fault zone”.

Fault 1573a, geomorphic expression

Insert the range of the facet height measurement into the second sentence; insert “(85 to 122 m)” following “110 m”.

Fault 1573a, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.2 mm/yr”.

Fault 1573b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1573b, name

In the fifth sentence delete the “has” following “Ruby Mountains fault zone”.

Fault 1573b, geomorphic expression

dePolo (1998) did measure a basal facet along Fault 1573b. Replace the fifth sentence with, “He reported a preferred maximum basal facet height of 98 m (74 to 122 m) along this section of fault zone.”

Fault 1573b, slip-rate category

Add the word “reconnaissance” before the words “slip rate” in the third sentence.

Fault 1582b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1582b, synopsis

The synopsis states twice, in the fourth and tenth sentences, that the sectioning of the fault zone was not addressed in any previous study. dePolo (1998) broke out these exact same sections, so this is not a true statement and should be deleted.

Fault 1582b, geomorphic expression

I’ve always worried these were relict facets in limestone. Because of the fault’s position and the magnitude of the reconnaissance rate generated, insert, “, but these may be relict facets” following “219 m” in the last sentence.

Fault 1582b, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, significant figure, “0.4 mm/yr”.

Fault 1590, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the Silver Zone Pass fault zone based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1709, map

Several scarps portrayed on Dohrenwend and others (1991) at the northernmost end of the Maverick Springs Range fault zone are missing from the map compilation. They appear to potentially be some of the youngest scarps along the zone and should be included, or their omission because of detailed studies, etc. should be discussed.

Fault 1709, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the entire fault (EK7A, EK7B) based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1711, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.3 mm/yr”.

Fault 1712, geomorphic expression

Indicate the uncertainty of the facet height measurement by inserting “(85 to 134 m)” following “110 m” in the third sentence.

Fault 1712, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.2 mm/yr”.

Fault 1713, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1716, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1717, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the eastern Cedar Ridge fault (the more continuous of many traces within this fault zone) based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1718, map

Even though the exact trace of the fault is uncertain in the central part of the Ruby Valley fault that is left blank on the map, this is a large enough fault zone and there is some discontinuous geomorphology in the gap, such that I think the gap on the map should be filled with a “dotted fault” trace along the range front.

Fault 1719, synopsis

The wrong facet height is reported. “207 m” should be “98 m” in the fourth sentence.

Fault 1719, geologic setting

I believe there are a few scattered facets along this range front, for example in the central part of the Chase Spring 7 ½ ‘ Quadrangle. The facets are pretty eroded and the facet measured is part of a larger slope (NW 1/4 Sec. 35, T33N, R63E). Whereas the significance and perhaps whether they are active basal facets is debatable, but facets are there. So I disagree with the second sentence stating that they are not.

Fault 1719, geomorphic expression

The wrong facet height is reported. “207 m” should be “98 m” in the last sentence.

Fault 1719, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, significant figure, “0.1 mm/yr”.

Fault 1720, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr to one of the faults in the western part of the zone based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1722, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the fault based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1723, geomorphic expression

Add the uncertainty to the facet height. Insert “(134 to 183 m)” following “158 m” in the last sentence.

Fault 1723, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.2 mm/yr”.

Fault 1723, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the fault based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Comments on data entries for the **Reno Quadrangle**

Fault 1300a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1300a, slip-rate category

Add to end of discussion, “Fontaine and Wesnousky (2000) estimate a vertical slip rate of 0.6 mm/yr for the Wassuk Range fault zone near Reese River Canyon, based on a 7.7 ± 0.1 meter scarp height in post-Lake Lahontan deposits” See reference under Fault 1326a in the Walker Lake sheet.

Fault 1310, slip-rate category

Insert “reconnaissance” before the words “vertical slip rate” in the first sentence.

Fault 1640, geomorphic expression

Add the uncertainty to the facet height measurement in the second sentence by inserting “(110 to 150 m)” following the “130 m”.

Add the uncertainty to the facet height measurement in the third sentence by inserting “(150 to 190 m)” following the “170 m”.

Fault 1640, slip-rate category

The second sentence can be written more clearly; replace with, “dePolo (1998 #2845) assigned a reconnaissance vertical slip rate of 0.3 mm/yr to the western strand based on an empirical relationship between his preferred maximum basal facet height and vertical slip rate.”

Fault 1643, compiler and affiliation

There is an extraneous “state Nevada” in this section.

Fault 1644, sense of movement

There is an extraneous “**Dip** not reported” at the end of the comments.

Fault 1644, geomorphic expression

Add the uncertainty to the basal facet height measurement in the first sentence by inserting “(61 to 110 m)” following “85 m”.

Fault 1644, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.1 mm/yr”.

Fault 1647, map

Several of these fault traces have late Pleistocene to Holocene activity in an area that is being urbanized. The scale of the maps make it difficult to indicate which the most important traces are, thus I have supplied a map prepared by Alan Ramelli of the NBMG that illustrates the major fault traces that should at least be changed in color to green (< 130 ka). The faults with the most recent Holocene movement are too difficult to compile at this time, but we’ll work on that in the future. Also note that there is a small group of faults that are colored blue on the USGS map, just south of Steamboat Hills. These faults should also be colored green. A fault trace that should be removed from the map is indicated on a xerox of the Reno Quadrangle.

Fault 1647, paleoseismology studies

In the last sentence of the second paragraph a radiocarbon sample is mentioned, but with an unreported age. Two radiocarbon ages of these samples were reported by Bell and others (1984) as 620 ± 70 ybp and 910 ± 70 ybp. Apparently there were two samples from the fissure infilling that were submitted. This sentence can be modified to indicate “two samples” following the “;” and following “radiocarbon dating,” can be replaced with, “and the ages of these samples are reported as 620 ± 70 ybp and 910 ± 70 ybp (Bell and others, 1984 #____).”

Bell, J.W., Slemmons, D.B., and Wallace, R.E., 1984, Roadlog - Reno to Dixie Valley - Fairview Peak Earthquake areas, in Lintz, J., ed. Western Geological Excursions: Geological Society of America, Field Trip Guidebook, v. 4, p. 425-472.

Fault 1647, slip-rate category

The second sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.3 mm/yr”. I would remove the “however” from the front of that sentence, and add, “for the range-front fault trace” following the slip rate estimate. There are multiple fault strands along this part of the zone.

Fault 1648, slip-rate category

The second sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.4 mm/yr”.

Fault 1649, date of compilation, length, and average strike

Values are missing.

Fault 1650 and 1651, length and average strike

Values are missing.

Fault 1652, slip-rate category

The second sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.2 mm/yr”.

Fault 1653, map

Fault trace in the area of the trench should be changed from green to orange (<15 ka), see discussion below.

Fault 1653, synopsis

Pease did three scarp profiles and used the Wallace method to interpret them along the Carson City fault. You can use this information to address the highlighted statement in the end of the synopsis [“Better check ...”].

Fault 1653, dip

70° southeast

comments:

“Dip measured from fault exposed in trench in the south side of “C” Hill by Ramelli and others (1998).” See reference in next section.

Fault 1653, detailed studies, below age of faulted deposits at the surface

Add, “A trenching investigation was conducted on the southern side of C-Hill by Ramelli and others (1998), near 39°09' N. latitude and 119°46' W. longitude. Ramelli and others (1998) concluded that the most-recent-event had less than a meter of vertical displacement (0.7 ± 0.3 m), and was expressed as a small fault scarp and a few large extensional fissures. The MRE likely occurred close in time to a 474 cal BP age from charcoal within one of the extensional fissures formed from the event (Ramelli and others, 1998). This charcoal is interpreted to have been at the surface at the time of faulting, and thus places a close upper bound on the faulting event. The penultimate event had a vertical offset of somewhat more than a meter (1.2 ± 0.3 m), and offset alluvium that yielded an age of 2750 cal BP, providing a maximum-limiting age for the event (Ramelli and others, 1998).

Pease (1979) comments that the Carson City fault forms large compound fault scarps in early Holocene alluvium. These scarps have three bevels that are interpreted to be three Holocene events with a total offset of 3.3 to 8.5 m (Pease, 1979).”

Ramelli, A. R., dePolo, C.M., and Bell, J.W., 1998, Paleoseismic studies of the northern Sierra Nevada Frontal fault zone: Final Technical Report, USGS NEHRP Award 1434-HQ-97-GR-03043, 16 p.

Fault 1653, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate to the first, single significant figure, “0.2 mm/yr”.

Fault 1653, length and average strike

Values are missing.

Fault 1654, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.2 mm/yr”.

Fault 1655, dip

At one location the dip measured in a trench exposure was 70° W (Trexler and Pease, 1980)

[reference is given below]

Fault 1655, paleoseismic studies

Add,

“The Eastern Reno Basin fault has been trenched in two places (SW 1/4 Sec. 23, T19N, R20E, and S ½ Sec. 3, T18N, R20E) by Trexler and Pease (1980). They placed three trenches at these sites, two across a range-front fault scarp (first site), and one across a tonal lineament identified on low-sun-angle aerial photography. In all three trenches Trexler and Pease (1980) conclude that the faulting was pre-soil development and interpret that the faulting was slightly pre-Sangamon in age, probably mid Pleistocene. In one of the range-front trenches, the total measurable offset was about 2 m down-to-the-west, and the orientation of the main fault was N15°E, dipping 70° west (Trexler and Pease, 1980).”

Trexler, D.T. and Pease, R.C., 1980, Geologic mapping of the Vista and Steamboat 7 ½ min. Quadrangles, Final Technical Report, Contract Number 14-08-0001-17774 sponsored by the U.S. Geological Survey, 32 p.

Fault 1655, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.1 mm/yr”.

Fault 1656, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.2 mm/yr”.

Fault 1657, slip-rate category

Minor comment - change the tense on the word “revising” in the second sentence and add the uncertainty to the slip-rate estimate by inserting “(0.9 to 0.36 mm/yr)” following the “0.22 mm/yr” in the same sentence.

Fault 1658, number

Extraneous “**Structure Name** Unnamed faults west of Hungry Valley” in comments section.

Fault 1659, map

The “green colored” fault in the northwest part of this group should probably go into the Honey Lake fault system group, Fault 1639. This fault trace does not bound the western part of Warm Springs basin, the basin is to the east. It is likely there is a nearly continuous structural connection between this trace and other northwest-striking fault traces in Bedell Flat.

Fault 1659, slip-rate category

The second sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the fault based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1660, slip-rate category

Add a sentence to indicate that there may be a significant lateral component. Add at the end of the comments, “There is no information about the potential lateral slip-rate component indicated by the overall orientation of the fault zone and geomorphic expression (small aligned depressions, side-hill benches).”

Fault 1661, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.1 mm/yr”.

Fault 1662, slip-rate category

The third sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.2 mm/yr”.

Fault 1663a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1668, date of historic deformation

At least two or three studies have suggested historical rupture along this fault. This should probably be mentioned. Insert, “Slemmons (1969) and Sanders and Slemmons (1979) suggested that the Olinghouse fault may have ruptured during an earthquake in 1869; this hypothesis connects a comment from a prospector that an earthquake caused ground rupture near Derby Dam in the 1860s to a young-looking rupture along the Olinghouse fault. dePolo and others (1997) alternatively suggested that if a historical earthquake caused the reported surface rupture, it may have been the 1860 earthquake, rather than the 1869. This is because Topozada and others (1981) located the 1869 earthquake further to the south near Virginia City based on earthquake intensity reports, and aftershocks of the 1860 earthquake were reported locally, in the neighborhood of Pyramid Lake (*Territorial Enterprise* 3/31/1860).”

Slemmons, D.B., 1969, Surface faulting from the December 26, 1869 Olinghouse, Nevada earthquake: Seismological Society of America Annual Meeting, p. 23.

Sanders, C.O. and Slemmons, D.B., 1979, Recent movements in the central Sierra Nevada-Walker Lane region of California-Nevada: part III, the Olinghouse fault zone, *Tectonophysics*, v. 52, p. 585-597.

dePolo, C.M., Anderson, J.G., dePolo, D.M., and Price, J.G., 1997, Earthquake occurrence in the Reno-Carson City urban corridor: *Seismological Research Letters*, v. 68, p. 401-412.

Topozada, T.R., Real, C.R., and Parke, D.L., 1981, Preparation of isoseismal maps and summaries of reported effects for the pre-1900 California earthquakes, California Division of Mines and Geology, Open-File Report 81-11SAC, 182 p.

Fault 1672, synopsis

A trenching study has occurred since this compilation by Trevor and Wesnousky (2001). Modify the last sentence to reflect this.

Fault 1672, paleoseismology studies

Insert, "Trevor and Wesnousky (2001) conducted a trenching investigation at the northern end of the Bradys Hot Spring fault and report 2.0 m of vertical separation for a single event exposed in the trench. Trevor and Wesnousky (2001) comment, "This event displaces a young (< 13 kyr) migrating lacustrine bar deposit and buried a weak soil beneath its colluvial wedge.""

Trevor, M.S., 2001, The neotectonic character of the Granite Springs Valley and Bradys fault zones, western Basin and Range: Seismological Society of America, Seismological Research Letters, v. 72, p. 256.

Fault 1672, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, "dePolo (1998 #2845) assigned a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for faults along the southeastern side of the Truckee Range based on the presence of alluvial fault scarps and the absence of active basal fault facets."

Fault 1673, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, "dePolo (1998 #2845) assigned a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the fault based on the presence of alluvial fault scarps and the absence of active basal fault facets."

Fault 1679, number

There is an extraneous "Structure Name Rainbow Mountain fault zone" that should be deleted.

Fault 1681, average strike (°)

Few if any faults are actually in the computer-generated strike. Replace with, "Faults have a

wide variety of orientations ranging from N30°W to N58°E.”

Fault 1682, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.3 mm/yr”.

Fault 1685, most recent prehistoric deformation (ka)

There is an extraneous “**Recurrence Interval** Not reported” in the comments that should be deleted.

Fault 1686, synopsis

The second sentence has an infinity sign (∞) that should be a degrees symbol ($^{\circ}$).

Fault 1686, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) assigned a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the fault based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1686, compiler and affiliation

There is an extraneous “**State Nevada**” that should be deleted.

Fault 1687a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1687b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1687b, paleoseismology studies

The last sentence of the first paragraph is apparently erroneous and should be deleted. It states that results are pending for the sixth trench, yet the results are presented in the seventh paragraph.

Fault 1688, date of historic deformation

The southernmost end of this fault is shown as historical on your map but this is not indicated in this section. The date would be December 16, 1954. I'm not sure where this originally came from, but a dotted historical rupture is shown proximal to this trace is shown by Slemmons (1957 #154), and is shown again in Slemmons and others (1959) [see below for reference].

Fault 1690, number

Misspelling of Fairview Peak fault system, spelled "Fairview Pear ...".

Fault 1690, slip-rate category

The first sentence should be modified to be more accurate. Insert the word "reconnaissance" before the first "vertical slip rate", and restrict the slip-rate estimate in the first sentence to the first, single significant figure, "0.3 mm/yr".

Fault 1691, date of historic deformation

This fault has ruptured at least once and likely twice historically in 1903 (Slemmons and others, 1959) and December 16, 1954 (Slemmons, 1957). These dates should be added to this section.

Fault 1691, date of historic deformation

This fault ruptured on December 16, 1954 (Slemmons, 1957). The Gold King fault also is suggested to have ruptured during the 1903(?) earthquake. These dates should be added to this section.

Fault 1691, map

A portion of this fault is shown as having ruptured in 1954 by Bell (1984) that is not indicated as having ruptured historically on the map.

Fault 1692, date of historic deformation

Add, "December 16, 1954"

Fault 1692, slip-rate category

The first sentence should be modified to be more accurate. Insert the word "reconnaissance" before the first "vertical slip rate", and restrict the slip-rate estimate in the first sentence to the first, single significant figure, "0.2 mm/yr".

NEW FAULTS TO ADD TO THE RENO SHEET**Eastern Prison Hill fault zone****Synopsis:**

The Eastern Prison Hill fault zone bounds the east side of Prison Hill and the eastern side of a small horst immediately north of Prison Hill, and extends as far as New Empire near Highway 50, a distance of about 9 km. The fault creates an abrupt range front with facets on the east side of Prison Hill with a short basal fault scarp, alluvial fault scarps in probable Sangamon-age alluvial fans, and the aligned, abrupt ends of Pleistocene alluvial deposits juxtaposing them against younger Holocene deposits. Fluvial modification of the fault scarp from the Carson River has occurred along the central part. The fault has normal, dip-slip displacement, and offsets probable Sangamon-age materials vertically at least 2.5 m as measured by scarp profiling. The fault has a Holocene, vertical offset that was measured to be at least 60 cm, and is expressed as a sharp scarp in grassy deposits.

Name:

Eastern Prison Hill fault zone

Comments:

First called the Eastern Prison Hill fault zone by dePolo (1996).

Number:

Comments:

State(s):

Nevada

County(s):

Carson City

AMS sheet(s):

Reno

Physiographic Province(s):

Basin and Range province

Geologic setting:

The Eastern Prison Hill fault system is a northerly striking, normal dip-slip fault that bounds the east side of Prison Hill, offsets a small piedmont at the northeast end of Prison Hill, and offsets alluvial deposits of Eagle Valley. The southern half of Prison Hill is composed of Cretaceous granodiorite, and the northern half is Jurassic dacite porphyry and metavolcanic breccia. Along the central portion of the fault, it bounds a small horst of Jurassic metavolcanic breccia and minor Tertiary sediments and mostly covered by Quaternary alluvium that extends northward from Prison Hill. The zone is made up of as many as four, subparallel and synthetic faults. The fault zone is parallel and synthetic to the Carson Range fault system to the west. Given the parallel-trace nature of the fault where exposed in older alluvium, other buried traces may exist under the young flood plain of the Carson River.

Reliability of location:

Good Scale of digital trace 1:12,000

Comments:

Fault traces taken from Bell and Trexler (1979).

Length:

About 9 km long

Average strike (°):

Sense of movement:

normal dip-slip

Comments:

Large-scale geomorphic expression and trench exposures of the fault indicate normal dip-slip movement.

Dip:

east, 55° to 60°

Comments:

Dip measured in a consultants trench across the fault.

Paleoseismic studies:

Geomorphic expression:

The northernmost part of the fault is expressed as a subtle, alluvial fault scarp and vegetation lineaments. The north-central portion appears to be an alluvial fault scarp that bounds the Carson River flood plain, and has been highly eroded by fluvial action. In the south-central part of the fault, at least four fault traces are distributed through some small hills and piedmonts about a kilometer wide; they form small, discontinuous alluvial scarps, the abrupt front of a hill, and a broad saddle between a small hill and Prison Hill. One compound scarp in probable Sangamon-age alluvium (soils include a prominent argillic horizon about 40-cm thick) offsets the ground surface 2.5 m vertically. A small, single-event scarp occurs along one of these fault traces in the NE 1/4 of section 22, T.15N., R.20E.. The southern third of the Eastern Prison Hill fault bounds Prison Hill, and is evidenced by fault facets, and at least one short fault scarp in loose, grussy alluvium. Fluvial modification may have occurred locally along this portion. This portion of the fault was originally mapped by McKinney (1976).

Age of faulted surficial deposits:

The age of deposits is at least less than 130 ka and possibly Holocene.

Date of historic deformation:**Most recent prehistoric deformation (ka):**

Late Pleistocene to Holocene (<15 ka)

Comments:

On the basis of small, abrupt alluvial scarp in Holocene materials, and Holocene offsets observed in multiple consultants trenches.

Recurrence Interval:**Slip-rate category:**

less than 0.2 mm/yr

Comments:

Using a vertical separation of 2.5 m (+0.5, -0.2 m) of the alluvial surface, a 55° dip observed in the trenches, and an age of 74 ka to 130 ka for the Sangamon interglacial period, a minimum(?) slip rate of 0.04 m/kyr, with a range of 0.02 to 0.05 m/kyr is estimated (dePolo, 1996). This may be a minimum because other, parallel traces may exist along the fault at this location.

Date of compilation:

4/3/02

Compiler and affiliation:

Craig M. dePolo, Nevada Bureau of Mines and Geology

References:

McKinney, R.F., 1976, Environmental geology of eastern Carson City, Nevada: unpublished M.S. Thesis, University of Nevada, Reno, 135 p.

New Empire fault zone

Synopsis:

The New Empire fault zone is a complex zone of short, normal dip-slip fault scarps that occur in the western piedmont of Prison Hill, bound the western side of uplifted alluvium within Eagle Valley, and occur in the northern piedmont of Eagle Valley. The southern and northern reaches of the fault zone have down-to-the-east displacement, whereas the central portion of the zone has down-to-the-west displacement. Fault scarps from 1.5 to 8.5 m high are common along the zone. The New Empire fault zone is, along parts, synthetic to the distributed Carson Range fault system that splays into and breaks up Eagle Valley. Along the central portion, the fault zone is largely antithetic to the Carson City fault and only lies about 2 km to the east. A large down-dropped graben between these two faults controls the deposition of the youngest sediments of Eagle Valley in this area.

Name:

New Empire fault zone

Comments:

First called the New Empire fault zone by dePolo (1996).

Number:

Comments:

State(s):

Nevada

County(s):

Carson City

AMS sheet(s):

Reno

Physiographic Province(s):

Basin and Range province

Geologic setting:

The New Empire fault zone is expressed as fault scarps and lineaments in late Pleistocene age alluvium, except where it bounds the west side of uplifted Tertiary sediments at Prison Hill. The southernmost end of the zone is made up of small, down-to-the-east scarps in latest Pleistocene alluvium (Trexler and Bell, 1979). The central part of the fault, which includes the Prison fault that bounds the west side of the hill that Carson City Prison is built on, has down-to-the-west displacement. This fault is about 2-km long and is expressed by a 2- to 4-m high fault scarp that bounds an uplifted late Pleistocene surface (Trexler and Bell, 1979). The north-central part of the zone is a series of down-to-the-east fault scarps and lineaments in the vicinity of Highway 50 mapped by Rogers (1975) and Bell and Trexler (1979). A scarp height of 8.5 m was measured by dePolo (1996) near the largest offset along this portion of the fault, where the fault offsets a surface that is assumed to be about Yarmouthian age (~180 ka) by Trexler and Bell (1979). The northern part of the New Empire is a series of northerly striking fault scarps and lineaments that extend up the piedmont flanking the Virginia Range. A small swarm of earthquakes in 1991 (maximum magnitude 4.6) may have occurred along this northern part of the zone (dePolo, 1996).

Reliability of location:

Good Scale of digital trace 1:12,000

Comments:

Fault traces taken from Bell and Trexler (1979).

Length:

About 4.5- to 7.5-km long

Average strike (°):

Sense of movement:

normal dip-slip

Comments:

Large-scale geomorphic expression of the fault indicates normal dip-slip movement. The downthrown side switches, however being down-to-the-east in the south and north, and down-to-the-west along the central part.

Dip:**Comments:****Paleoseismic studies:****Geomorphic expression:**

The geomorphic expression of the New Empire fault zone consists of fault scarps, usually singular, but with multiple, parallel scarps along the southern and north-central part, and vegetation lineaments. Along the central portion of the zone, the fault scarp is back-facing and ponds Holocene alluvium (Bingler, 1977); the main drainage from Eagle Valley is appears to be generally deflected by the scarp, and the drainage is entrenched into alluvium in the footwall.

Age of faulted surficial deposits:

The age of offset surfaces range from mid. to late Pleistocene.

Date of historic deformation:**Most recent prehistoric deformation (ka):**

Mid to late Pleistocene, and possibly significantly younger

Comments:

Offset surfaces are mid to late Pleistocene in age, but the abrupt nature of some of the fault scarps, and the apparent ponding of younger age alluvium along the central portion of the fault indicate that more recent activity likely occurred.

Recurrence Interval:**Slip-rate category:**

less than 0.2 mm/yr

Comments:

dePolo (1996) estimated a 9.8 ± 1 m offset from a scarp profile and assumption of 60° dip, of deposits that are estimated to be about 180 ka, giving an approximate slip rate of 0.05 mm/yr.

Date of compilation:

4/10/02

Compiler and affiliation:

Craig M. dePolo, Nevada Bureau of Mines and Geology

References:

Bell, J.W. and Trexler, D.T., 1979, Earthquake Hazards map of the New Empire Quadrangle: Nevada Bureau of Mines and Geology, Map 1Bi, 1:24,000 scale.

Bingler, E.C., 1977, New Empire Geologic Map: Nevada Bureau of Mines and Geology, Map 59, 1:24,000 scale.

dePolo, C.M., 1996, Local Quaternary faults and associated potential earthquakes in the Reno-Carson City urban areas, Nevada: Final Technical Report to the NEHRP, contract # 1434-95-G-2612, 50 p.

Rogers, D.K., 1975, Environmental Geology of Northern Carson City, Nevada: University of Nevada, Reno, 133 p.

Trexler, D.T. and Bell, J.W., 1979, Earthquake hazard maps of Carson City, New Empire and South Lake Tahoe, Quadrangles: Final Technical Report to U.S. Geological Survey NEHRP contract 14-08-0001-G-494, 43 p. + 3 appendices.

Comments on data entries for the **Millet Quadrangle**

Fault 1171a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1171a, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) assigned a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the fault based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1171b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1171b, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) assigned a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the fault based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1173, synopsis

Insert “the lack of” before the second “basal fault facets” in the fourth sentence.

Fault 1173, slip-rate category

The first sentence in the comments can be more accurately worded, and a second sentence can be added to indicate the multiple-parallel fault traces that characterizes this group. Replace with, “dePolo (1998 #2845) assigned a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the fault based on the presence of alluvial fault scarps and the absence of active basal fault facets. The fault group is made up of several, parallel fault traces that should be considered in an overall slip rate.”

Fault 1175, name

There is an uncertainty expressed in the discussion as to where the name “Ravenswood” comes from. The range of mountains west of the fault are called “Ravenswood” and this is portrayed on several 7½ minute quadrangles in the area.

Fault 1175, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) assigned a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the fault based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1176, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) assigned a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the fault based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1177, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) assigned a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the fault based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1178b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1178b, geomorphic expression

Because maximum basal facet heights are mentioned for most of the other faults you can include a statement here. “Basal facets up to 100 m high exist along the fault zone.”

Fault 1178b, slip-rate category

Replace the first two sentences of the comments with, “dePolo estimated a vertical slip rate of about 0.2 mm/yr based on an unpublished measurement of an offset alluvial terrace just south of Pat Canyon, north of Nevin. The offset was about 13 m with a buried lower original surface, and the offset unit was estimated to be 60-kyr old based on relative soil development (35 to 130 kyr).

Depending on the accuracy of these estimates, a significant amount of burial of this surface would make this a minimum estimate. There is also an additional, parallel fault trace at this site”

Fault 1181, geomorphic expression

In the last sentence of the discussion, insert the word “maximum” before the words “basal fault”.

Fault 1183, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.1 mm/yr”.

Fault 1187, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.3 mm/yr”.

Fault 1189, geologic setting

In the sixth sentence the comment is made about facets as much as 122 m high. This is the upper end of the estimate range, and the whole range should be expressed if this is used.. Replace “122 m” with “98 to 122 m”.

Fault 1189, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.2 mm/yr”.

Fault 1190, name

Minor error near the end of the second sentence. Replace “Eastern” with “Western”.

Fault 1190, slip-rate category

Add recent USGS, Machette and others trench data, and that dePolo's (1998) age estimate is likely a factor-of-two too young based on observation of petrocalcic units in the deposits dePolo used.

Fault 1191, geologic setting

Rewrite the end of the last sentence so that it is clearer. The estimated rates are moderate to slow rates, dependent on one's point of view. Replace "moderate to relatively rates" with "relatively moderate Quaternary rates".

Fault 1191, slip-rate category

The first sentence should be modified to be more accurate. Insert the word "reconnaissance" before the first "vertical slip rate", and restrict the slip-rate estimate in the first sentence to the first, single significant figure, "0.2 mm/yr".

Fault 1192, slip-rate category

The first sentence should be modified to be more accurate. Insert the word "reconnaissance" before the first "vertical slip rate", and restrict the slip-rate estimate in the first sentence to the first, single significant figure, "0.3 mm/yr".

Fault 1193a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1193a, slip-rate category

The first sentence should be modified to be more accurate. Insert the word "reconnaissance" before the first "vertical slip rate", and restrict the slip-rate estimate in the first sentence to the first, single significant figure, "0.1 mm/yr".

Fault 1193b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1193b, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.2 mm/yr”.

Fault 1195, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.1 mm/yr”.

Fault 1197, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) assigned a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the fault based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1200, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.1 mm/yr”.

Fault 1201, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) assigned a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the fault based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1202, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.1 mm/yr”.

Fault 1203, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) assigned a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the fault based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1204a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1204b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1205, most recent prehistoric deformation (ka)

The data entry is “latest Quaternary (<15 ka)” whereas on the map the fault is green (<130 ka). These two should be the same. Should the data entry be changed or the map?

Fault 1205, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) assigned a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the fault based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1334a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1334a, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.2 mm/yr”.

Fault 1335a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1335a, geomorphic expression

Some mention of facet heights is probably warranted because of the reporting of the reconnaissance slip rate. Add the following sentence to the end of the discussion. “dePolo (1998 #2845) reported a maximum basal facet height of 158 m along this zone.”

Fault 1335a, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.2 mm/yr”.

Fault 1336a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1336a, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) assigned a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the fault based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1336b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1336b, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) assigned a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the fault based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1336c, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1336c, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.4 mm/yr”.

Fault 1336d, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1336d, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) assigned a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the fault based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1337a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

ADDITIONAL FAULTS?

Check on the features north of Combs Peak, T18&19N, R52&53E that bound the closed depression. Are these Quaternary faults? If so include them.

Comments on data entries for the **Ely Quadrangle**

Ely Map - general

You might check the fault locations on this quadrangle by plotting them out on a topographic map if you haven't already done so. I was comparing a folded paper map to another folded paper map so this may have been the total source of the mismatches I noticed. Thus, I normally wouldn't say anything, but really struck by the large number of mismatches between the USGS map and Dohrenwend and other's map, even over very short distances. I'd say if the topography matches the faults that it should, this would be a good check.

Fault 1211a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1211a, geomorphic expression

The facet-height measurement was made from Fault 1211b. Thus the second sentence can be deleted from the discussion.

Fault 1211a, slip-rate category

The facet-height measurement was made from Fault 1211b. Thus the first two sentences of the comments can be deleted.

Fault 1211b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1211b, geomorphic expression

The basal facet height is a bad estimate on my part; a value more like 85 m rather than 183 m is a better estimate. How about inserting following the estimate "183 m", "(although dePolo in reviewing this value feels this is too high)".

Fault 1211b, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.3 mm/yr”.

Fault 1212a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1212a, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.4 mm/yr”.

Fault 1212b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1212b, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.4 mm/yr”.

Fault 1213, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) assigned a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the fault based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1217, map

This fault appears to be labeled as Fault 1380a on the map

Fault 1223, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) assigned a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the fault based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1235, name & top of data sheet

No name or comment is given. Insert “Unnamed faults northwest of Giroux Wash”.

Fault 1238, name & top of data sheet

No name or comment is given. Insert “Unnamed faults along the western Schell Creek Range”.

Fault 1238, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) assigned a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the fault based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1245, slip-rate category

No slip-rate category is indicated. I assume this fault would fall into the <0.2 mm/yr category, using the justification given in other fault entries, such as for Fault 1244.

Fault 1259, length and average strike

Values in the categories are missing.

Fault 1259, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) assigned a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the fault based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1261, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) assigned a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the fault based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1272, slip-rate category

Replace the first sentence with, “dePolo (1998 #2845) assigned a vertical slip rate of 0.054 mm/yr based on a 38 m offset of alluvial deposits north of Ely estimated to be about 700 kyr old.”

Fault 1272, synopsis and geomorphic expression

A minor characteristic of these faults/scarps that is worth mentioning is that they are all west-side down, or west-facing fault scarps. To convey this, insert the words “west-facing” before the word “scarps” in the first sentence of each section (synopsis and geomorphic expression).

Fault 1275, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.3 mm/yr”.

Fault 1276, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) assigned a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the fault based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1277, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) assigned a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the fault based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1278, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) assigned a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the fault based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1282, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) assigned a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the fault based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

ADDITIONAL FAULTS

The only scarps that seem to be missing from the map are a set mapped by Dohrenwend and others in the southwest corner of the map, along the west side of the Pancake Range.

Comments on data entries for the **Walker Lake Quadrangle**

[NOTE: there are two sets of numbers in this set of comments because a group of data entries from this quadrangle was received after the initial review was written]

Fault 1286, map

The northernmost part of this zone should be divided into two faults that have more affinities towards tectonism in Eagle Valley than the Eastern Carson Valley system. These faults are the Eastern Prison Hill fault zone and the New Empire fault zone. Write ups for these faults are included in the Reno Quadrangle.

Alan Ramelli, Thomas Muntean, and myself are mapping the geology of the Gardnerville Quadrangle, which includes many (~200) fault traces from the central part of this fault swarm. When this is finalized, hopefully this summer, I send you a copy to check the USGS fault traces against.

Fault 1286, synopsis

The date of the Bell and Helm (1998) reference is wrong; it is given as (1988).

Fault 1286, date of historic deformation

This section is missing for this fault. Two dates should be entered for Fish Springs Flat, a trace of this zone; summer, 1988 and September 12, 1994. These dates are discussed elsewhere in this write up for referencing.

Fault 1286, length, average strike, endpoints

Values are missing.

Fault 1287, map and data entries

The northern part of this zone should be separated as the Double Springs Flat fault that has an important, possibly even dominant right-lateral strike-slip component, and was seismically active in 1994. This zone should have a separate data file.

Fault 1287, length and average strike

Values are missing.

Fault 1288, synopsis

In the first sentence insert a "the" following the word "crosses" to make the sentence read better.

Fault 1288, length, average strike

Values are missing.

Fault 1289, slip-rate category

The first sentence should be modified to be more accurate. Insert the word "reconnaissance" before the first "vertical slip rate", and restrict the slip-rate estimate in the first sentence to the first, single significant figure, "0.3 mm/yr".

Fault 1290, date of historic deformation

Add "September 12, 1994". There was a small, sympathetic fracture in the central part of this zone.

Fault 1291b, map

Connect the discontinuous sections of the fault together with dots along the range front, including a dotted connection along the range front to Fault 1291c.

Fault 1293

The southeasternmost part of this group of faults should be separated into a fault called the Cambridge Hills fault by dePolo (1998), his fault WL9. I indicate this is a normal fault with a slip rate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal facets. See highlighted map for traces that should be included.

Fault 1294, name, geologic setting, sense of movement, dip, geomorphic expression, and references

In all these sections the name Proffett is misspelled as “Proffet” leaving the final “t” off.

Fault 1294, geologic setting

Add the following to the end of the discussion,

Proffett and Dilles (1984 #2891) show Quaternary alluvium generally in fault contact along the Singatse Range fault zone, with over 450 m of Quaternary alluvium adjacent to the fault. Proffett (1977 #2889) notes that late Pleistocene fan conglomerate is offset a few meters to a few tens of meters by the Singatse Range fault zone, and that southwest of Mason, Holocene fan conglomerate is offset about a meter.

Fault 1294, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.2 mm/yr”.

Fault 1296

Some of these faults should be included in the Cambridge Hills fault; see discussion on Fault 1293 and highlighted map.

Fault 1298, length, average strike, endpoints

Values are missing.

Fault 1300b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1300c, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1304

Some of these faults are part of the Rattlesnake Flat fault, discussed by dePolo and others (1993), and mentioned by dePolo (1998). This is a left-lateral strike-slip fault (see Stewart and Carlson, 1978; Geology Map of Nevada) that has been informally studied by Bob Bucknam, among others. See highlighted map.

Fault 1307, most recent prehistoric deformation (ka)

This should be the latest Quaternary (<15 ka) category based on Pearthree's (1990) work. Insert the following sentence into the discussion,

Pearthree (1990 #148) measured and modeled 11 fault-scarp profiles of the most-recent event along the Indian Head fault, and estimated its age to be about 4.5 to 5.5 kyr

Fault 1307, slip-rate category

The first sentence should be modified to be more accurate. Insert the word "reconnaissance" before the first "vertical slip rate", and restrict the slip-rate estimate in the first sentence to the first, single significant figure, "0.3 mm/yr".

Fault 1312, slip-rate category

The first sentence should be modified to be more accurate. Insert the word "reconnaissance" before the first "vertical slip rate", and restrict the slip-rate estimate in the first sentence to the first, single significant figure, "0.1 mm/yr (with a minimum value of 0.09 mm/yr and a maximum value of 0.3 mm/yr) ...".

Fault 1314, slip-rate category

The first sentence should be modified to be more accurate. Insert the word "reconnaissance" before the first "vertical slip rate", and restrict the slip-rate estimate in the first sentence to the first, single significant figure, "0.1 mm/yr".

Fault 1318, name

The main faults in the northern part of this group were referred to as the "Candelaria fault" by dePolo (1998)[dePolo's WL24A, WL24B]; this includes most of the faults in this group, so I

would use the name rather than leave them unnamed.

Fault 1318, sense of movement

Add a “sinistral” component to the sense of movement. In the comments you can note, “dePolo (1998 #2845) indicates a strike-slip component to the Candelaria fault, supported partly by focal mechanisms of proximal earthquakes (e.g., see event 10 from Figure 10 and Table 1 of dePolo and others, 1993).

dePolo, C.M., Peppin, W.A., and Johnson, P.A., 1993, Contemporary tectonics, seismicity, and potential earthquake sources in the White Mountains seismic gap, west-central Nevada and east-central California, USA: *Tectonophysics*, v. 225, p. 271-299.

Fault 1320a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1320, slip-rate category

The last sentence of the comments can be rewritten to give more information. Replace with,

“Bell (1995 #2422) determined a lateral to vertical slip ratio based on slickensides of 1.5:1 to 2:1, and used this ratio to determine net slip rates. Using a range of net offset of 6.6 to 9 m, and an age of 22 to 25 ka, Bell estimates net slip rates of 0.26 to 0.41 mm/yr. For the older deposit, Bell used 13.2 to 18 m of net offset and an age range of 60 to 100 ka to estimate the net slip rates of 0.13 to 0.30 mm/yr.”

Fault 1320b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1326a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1326a, slip-rate category

Fontaine and Wesnousky (2000) estimate a late Pleistocene slip rate of a minimum of 1 to 3 mm/yr for the Petrified Spring fault, thus the category should be changed from "0.2 to 1 mm/yr" to "1 to 5 mm/yr". Contact Dr. Steven Wesnousky of the Center for Neotectonic Studies for the exact location and which fault traces to portray with what rates.

Add to the comments,

Fontaine and Wesnousky (2000) estimate a late Pleistocene slip rate of a minimum of 1 to 3 mm/yr for the Petrified Spring fault.

Fontaine, S.A. and Wesnousky, S.G., 2000, Aspects of neotectonics in the central Walker Lane belt, west-central Nevada: Geological Society of America, Program with Abstracts, v. 32, p A-167.

Fault 1326b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1285, 1285a, 1285b several sections

Throughout these section is a reference to Ramelli and others, "in press" that should be Ramelli and others "(1999)". The reference gives both in press and 1999, but is incomplete. Change all Ramelli and others ("in press") to Ramelli and others ("1999"). To complete the Ramelli and others reference add, "v. 89, p. 1458-1472".

Also note that the values are missing from the length, average strike, and endpoints sections.

Fault 1291, length and average strike

Values are missing.

Fault 1291, section name

Incomplete entry. Complete with, "between north of Bull Canyon and south of Churchill Canyon."

Fault 1291a, slip-rate category

Reason for lower slip rate assignment is missing. The slip rate estimates are Holocene rates and likely include open-ended time intervals, so perhaps they are too short a time frame for sampling and possibly too high of rates because of the open-ended interval. Nevertheless, the calculated range should remain in the range of possibilities.

Fault 1291a, length and average strike

Values are missing.

Fault 1291b, section name

Entry is incomplete. Complete with, "adjacent to Artesia Lake".

Fault 1291b, length and average strike

Values are missing.

Fault 1291c and 1291d

I see no reason to break out these sections.

Fault 1291c section name

Entry is incomplete.

Fault 1291c, length and average strike

Values are missing.

Fault 1291d, section name

Entry is incomplete. Complete with, "near Wellington".

Fault 1291d, length and average strike

Values are missing.

Fault 1291e, section name

Entry is incomplete. Complete with, "near Sweetwater Flat".

Fault 1291e, length and average strike

Values are missing.

Fault 1291e, slip-rate category

Add to comments, "dePolo (1998 #2845) estimated a reconnaissance vertical slip rate of 0.2 mm/yr based on an empirical relationship between his preferred maximum basal facet height and vertical slip rate. The size of the facets (tens to hundreds of meters, as measured from topographic maps) indicates they are the result of many seismic cycles, and thus the derived slip rate reflects a long-term average." There is a sentence of two more you guys commonly used to justify the >0.2 category and I leave it to you to finish this off.

Fault 1297, 1298, 1299, 1301, 1302, 1303, length, average strike, endpoints

Values are missing

Fault 1299, structure name

These names usually include some indication of location. Although a bit long, how about, "Unnamed faults near Powell Mountain, Mount Hicks, and Alkali Valley."

Fault 1299, 1301, 1302, 1303, date of compilation

Very complex and perhaps coded? entry - extraneous characters?

Fault 1301, structure name

“Unnamed faults in southwestern Excelsior Mountains and southern Anchorite Hills.”

Fault 1302, structure name

“Unnamed faults southwest, west, and northwest of Huntoon Valley and Little Huntoon Valley.”

Fault 1303, structure name

“Unnamed faults southeast of Huntoon Valley to west of Teels Marsh.”

Fault 1321a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1321a, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.2 mm/yr”.

Fault 1321b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1321b, geomorphic expression

dePolo (1998) made his facet measurement along Fault 1321a, therefore the last sentence of this discussion can be deleted.

Fault 1321b, slip-rate category

dePolo (1998) made his facet measurement along Fault 1321a, therefore the first couple of sentences can of the comments should be deleted.

Fault 1322, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Comments on data entries for the **Tonopah Quadrangle**

Fault 1328, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1334b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1334b, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.2 mm/yr”.

Fault 1335b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1335b, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.1 mm/yr”.

Fault 1337b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1337b, geomorphic expression

dePolo (1998) made the slip-rate measurement along Fault 1337a, therefore the last sentence of the discussion should be deleted.

Fault 1337b, slip-rate category

dePolo (1998) made the slip-rate measurement along Fault 1337a, therefore the first sentence of the comments should be deleted.

Fault 1340, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1344, slip-rate category

The first sentence should be modified to be more accurate. Replace with, “dePolo (1998 #2845) assigned a reconnaissance vertical slip rate of 0.2 mm/yr for the northern part of the fault, and 0.01 mm/yr for the southern part based on the presence of alluvial fault scarps and the absence of basal fault facets.”

Fault 1346, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.2 mm/yr”.

Fault 1349a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1349a, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.2 mm/yr”.

Fault 1349b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1349b, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.1 mm/yr”.

Fault 1351, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.2 mm/yr”.

Fault 1352a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1352a, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.1 mm/yr”.

Fault 1352b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1352b, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.1 mm/yr”.

Fault 1354, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence

of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1355, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.5 mm/yr”.

Fault 1358, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1359, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1365, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1366a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1366a, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1366b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1366b, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1367a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1367a, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1367b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1367b, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

ADDITIONAL FAULTS

There are a series of faults shown on Dohrenwend (unpublished) that bound the northeastern side of the Hot Creek Range that appear to occur along a pretty distinct piedmont/range front transition. Is there evidence this is not Quaternary? If not consider adding it to the data set.

Comments on data entries for the **Lund Quadrangle**

Fault 1374a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1374b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1373, dip direction of fault

None given for normal faults. Topographically the dip direction may be northwest(?).

Fault 1378, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1380b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1380b, slip-rate category

The second sentence is accurate, that is what dePolo (1998) said, but it is wrong and should not have been entered into dePolo’s data set that way. I would recommend deleting the second sentence of the comments following “However, ...”.

Fault 1380c, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1380c, slip-rate category

The second sentence is accurate, that is what dePolo (1998) said, but it is wrong and should not have been entered into dePolo's data set that way. I would recommend deleting the second sentence of the comments following "However, ...".

Fault 1380d, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1380d, slip-rate category

The second sentence is accurate, that is what dePolo (1998) said, but it is wrong and should not have been entered into dePolo's data set that way. I would recommend deleting the second sentence of the comments following "However, ...".

Fault 1380e, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1380e, slip-rate category

The second sentence is accurate, that is what dePolo (1998) said, but it is wrong and should not have been entered into dePolo's data set that way. I would recommend deleting the second sentence of the comments following "However, ...".

Fault 1381, slip-rate category

The first sentence should be modified to be more accurate. Insert the word "reconnaissance" before the first "vertical slip rate", and restrict the slip-rate estimate in the first sentence to the first, single significant figure, "0.1 mm/yr".

Fault 1382a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1382b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1382c, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1389, name

To be consistent with other entries, insert, “dePolo (1998 #2845) referred to this zone as the Preston fault.

Fault 1389, number

Insert at the end of the sentence, “, and LD4 of dePolo (1998 #2845)”.

Fault 1389, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1393, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1398, slip-rate category

Insert the word vertical between the words “maximum” and “slip” in the second (last) sentence.

Fault 1406, most recent prehistoric deformation (ka)

This should be the “middle to late Quaternary” category according to the comments. Ok on map.

Fault 1410, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1430, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1381, slip-rate category

The first sentence should be modified to be more accurate. Insert the word “reconnaissance” before the first “vertical slip rate”, and restrict the slip-rate estimate in the first sentence to the first, single significant figure, “0.1 mm/yr”.

Comments on data entries for the **Goldfield Quadrangle**

Fault 1041, geologic setting and reliability of location

Minor spelling error on the "Boundary" in the first sentence.

Fault 1088, slip-rate category

The second sentence should be modified to be more accurate. Insert the word "reconnaissance" before the first "vertical slip rate", and restrict the slip-rate estimate in the second sentence to the first, single significant figure, "0.1 mm/yr". This range is basically a precision and I would drop it, but if it is to be reported it should be "(0.1 to 0.3 mm/yr)".

Fault 1094, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, "dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets."

Fault 1096, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, "dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets."

Fault 1102, synopsis

The last sentence of the synopsis can be more accurately worded. Replace with, "A preferred reconnaissance vertical slip rate of 0.1 mm/yr was estimated for the fault based on an empirical relationship between vertical slip rate and maximum basal facet height."

Fault 1102, slip-rate category

The first sentence can be reworded to be more accurate. Replace with, "A preferred reconnaissance vertical slip rate of 0.1 mm/yr was estimated for the fault based on an empirical relationship between vertical slip rate and maximum basal facet height."

Fault 1104, synopsis

The last sentence of the synopsis can be more accurately worded. Replace with, "A preferred reconnaissance vertical slip rate of 0.2 mm/yr was estimated for the fault based on an empirical relationship between vertical slip rate and maximum basal facet height."

Fault 1104, slip-rate category

The first sentence can be reworded to be more accurate. Replace with, "A preferred reconnaissance vertical slip rate of 0.2 mm/yr was estimated for the fault based on an empirical relationship between vertical slip rate and maximum basal facet height."

Fault 1105, synopsis

The reconnaissance slip rate estimate was made along the Clayton Ridge fault rather than the Paymaster Ridge fault, therefore the last sentence of the synopsis should be deleted.

Fault 1105, slip-rate category

The reconnaissance slip rate estimate was made along the Clayton Ridge fault rather than the Paymaster Ridge fault, therefore the first sentence of the slip-rate category should be deleted.

Fault 1107, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, "dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets."

Fault 1329a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1329b, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1329c, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1731, slip-rate category

The wrong category is apparently assigned. The comments conclude and the map shows the "0.2 to 1 mm/yr" category, whereas the category in the input slot is "less than 0.2 mm/yr". I assume the former category should be assigned.

Faults 49a-d, length and average strike

Values are missing.

ADDITIONAL FAULTS

The White Mountains fault system and the Coaldale faults are missing from the Mariposa Sheet; I assume these will be included in the California data set.

There was a fault identified by the SDO team for Yucca Mountain, that was called the South Silent Canyon fault that may be included in this compilation. The fault appeared to be ponding Quaternary alluvium in an environment where the alluvium could be carried away, indicating potential Quaternary activity.

Comments on data entries for the **Caliente Quadrangle**

Fault 1045, sense of movement

Reheis (1992) indicates there is a right-lateral component on a couple of these faults. This should be indicated and the sentence in the comments extended to reflect this with, "offsets, and some traces with right-lateral components."

Fault 1045, slip-rate category

Add to comments, "dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the Emigrant Valley faults based on the presence of alluvial fault scarps and the absence of active basal fault facets."

Fault 1046, slip-rate category

Add to comments, "dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets."

Fault 1048, slip-rate category

Add to comments, "dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets."

Fault 1052, slip-rate category

Add to comments, "dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets."

Fault 1121, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, "dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets."

Fault 1123, most recent prehistoric deformation (ka)

At minimum, probably should indicate in the comments section to, “see discussion under “Age of faulted surficial deposits””.

Fault 1123, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1124, slip-rate category

Add, “Near the central part of the fault is a scarp in mid-Quaternary age alluvium (Swadley, 1995 #2621) and an adjacent graben, up to 130-m wide. dePolo (1998 #2845) estimated the net vertical displacement across this graben and west-facing scarp was about 5.1 m (4.0 to 6 m), and correlated the soil to be at least as well developed as the “Yucca surface” of Peterson and others (1995), but is slightly less developed as the “Solitario surface”, which would bracket the age between approximately 375 and 730 ka. The mean of the bracketing ages, 550 ka, was used for the estimate. The preferred vertical slip rate estimated by dePolo (1998 #2845) was 0.008 mm/yr, with a range of 0.005 to 0.014 mm/yr.”

The Peterson and others (1995) reference is:

Peterson, F.F., Bell, J.W., Dorn, R.I., Ramelli, A.R., Ku, The-Lung, 1995, Late Quaternary geomorphology and soils in Crater Flat, Yucca Mountain area, southern Nevada: Geological Society of America Bulletin, v. 107, p. 379-395.

Fault 1128, slip-rate category

Add to comments, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1130, geologic setting

Switzer (1996) details what I think Taylor and others (1998 #3844) were describing as the segment boundary along the Hiko fault; this is uncertain in the last sentence of the discussion.

These researchers consider the Hiko fault to extend to the southeast along the east side of Pahranaagat Valley, and the segment boundary to be at the salient approximately between Crystal Springs and Hiko. This boundary is said by Switzer to be a likely nucleation or termination area for an earthquake rupture. Replace the last sentence with “Switzer (1996) and Taylor and others (1998 #3844) propose that there is a structural and geometric discontinuity in the Hiko fault between Crystal Springs and Hiko. The fault they consider includes a pre-Quaternary(?) strand to the southeast, along the eastern side of Pahranaagat Valley.”

Switzer, Douglas D., 1996, The geology and structures in the northern Hiko Range, Lincoln County, Nevada: University of Nevada, Las Vegas, unpublished MS Thesis, 119 p., map, scale 1:24,000.

Fault 1130, sense of movement

Add to the comments, “Switzer (1996) notes that slickenlines on fault surfaces in two areas have rakes of 85 degrees south and 88 degrees north, supporting a predominantly normal dip-slip displacement along the Hiko fault.”

Fault 1130, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1132a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1132a, synopsis and name

There are extraneous symbols in the text that should be deleted (e.g.,).

Fault 1402, slip-rate category

Add to comments, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1404, AMS sheet(s)

This zone is squarely in the Lund Quadrangle. Delete Caliente Quadrangle.

Fault 1734, name

The southernmost fault trace of this group is perhaps the most pronounced and was referred to as the Panaca fault by dePolo (1998). You can indicate this by inserting, "dePolo (1998 #2845) referred to the southernmost trace of this group of faults as the Panaca fault."

Fault 1734, slip-rate category

Add to comments, "dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr for the Panaca fault based on the presence of alluvial fault scarps and the absence of active basal fault facets."

Fault 1738, slip-rate category

Add to comments, "dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets."

Fault 1739, slip-rate category

The category assignment is missing. I assume it is "less than 0.2 mm/yr".

Add to comments, "dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets."

ADDITIONAL FAULTS

There are several fault scarps in Tikaboo Valley that are shown by Dohrenwend (unpublished) and are omitted from the USGS compilation.

Comments on data entries for the **Death Valley Quadrangle**

Faults 1080 and 1081

This is too limited of a discussion for such important faults that will be bearing scrutiny and evaluation from many in the near future. These discussions need to be expanded and I would like to review the new entries. The major limitations are that: 1) the groups of faults need to be broken out as separate sections for each major fault so people can easily access information, say for example looking up the Solitario Canyon fault, and so the paleoseismic information can be relatively easily understood and evaluated, 2) more major secondary faults should be shown on the map than are, for example small scarps and major lineaments in Quaternary alluvium rather than solely the main fault traces, 3) trench locations need to be indicated, 4) paleoseismic information needs to be summarized, rather than just technique summaries (e.g., four events have been recognized along the Solitario Canyon fault. In Trench SC1 evidence for two of these events - ok, so it would be written a lot better than this, but this is what has to be summarized), and 5) the geomorphic expression, etc. of each fault needs to be summarized. This is all a daunting task, although most of this information (e.g., a summary of evidence from a trench) probably exists. Many summaries have been done by the USGS for review panels, and so forth. Further, the USDOE is pushing for licensing of the Yucca Mountain site and may be interested in a technology/information transfer as your web site, and may support putting this information together. The faults I would have specific discussions for are the:

Black Cone fault?
 Northern Crater Flat fault
 Southern Crater Flat fault
 Windy Wash fault zone
 Fatigue Wash fault
 Solitario Canyon fault
 Iron Ridge fault
 Stagecoach Road fault
 Paintbrush Canyon fault
 and Bow Ridge fault
 Ghost Dance fault? - Exploratory trenching

These can be sections of your overall east and west fault groups. I know this is bad news from a work load point of view, but I'm sure you recognize the importance of these faults for the nation. I would like the opportunity to review these new sections when they are ready.

ADDITIONAL FAULTS

The Highway 95 or Carrara fault should be included; I believe Quaternary activity has been documented or inferred along it. John Whitney from the USGS can probably help you with this.

Comments on data entries for the **Las Vegas and Kingman Quadrangle**

Fault 1057, slip-rate category

The fourth sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1060, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1061, geologic setting

There is an extraneous “t” following the word “Transector” in the last sentence.

Fault 1061, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1063, sense of movement

The left-lateral component should probably be indicated on the map with a set of arrows.

Fault 1063, slip-rate category

The first sentence in the comments can be more accurately worded. Replace with, “dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets.”

Fault 1064, slip-rate category

Add to comments, "dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets."

Fault 1072, map

The fault should be blue on the map (see most recent prehistoric deformation section), and it is currently black.

Fault 1072, slip-rate category

The category is missing. I assume it is "less than 0.2 mm/yr".

Fault 1073, reliability of location

Scale is missing.

Fault 1073, sense of movement

Second sentence in the comments should say "dextral" rather than sinistral.

Fault 1075, geomorphic expression

Delete the "age of faulted deposits" section that has been included in this section.

Fault 1075, slip-rate category

The third sentence in the comments can be more accurately worded. Replace with, "dePolo (1998 #2845) reported a reconnaissance vertical slip-rate estimate of 0.01 mm/yr based on the presence of alluvial fault scarps and the absence of active basal fault facets."

Fault 1076, reliability of location

Scale is missing.

Fault 1115, map

You might double check some aerial photographs of the range front fault and the west side of Mule Ridge. There is concern, especially from my colleagues from the Las Vegas area, that too little of some of these faults is being represented, and there is concern about taking faults off the map that may later be put back on the map. I don't have a specific recommendation at this time; I guess I'm tempted to trust Yount's work, and the weight of his conviction appears to come from the lack of offset of alluvium. I can see a few scattered possible scarps on U2 photography, perhaps they are bedrock or fault-line scarps. If there may be an early Quaternary fault, perhaps it should be dotted or dotted and questioned on the map.

Fault 1115, slip-rate category

The second sentence is incorrect. Replace with, "dePolo (1998 #2845) reported a vertical slip rate of 0.044 mm/yr (0.026 to 0.12 mm/yr) for the fault based on a vertical surface separation of 19 m (\pm 2 m), corrected for a surface slope of 4 degrees and a dip of 50 degrees, and an estimated age of the offset surface of 500 ka (200 to 730 ka) based on a correlation to surfaces at Yucca Mountain.

Fault 1116, map [Kingman Quad.]

The portion of the fault that has the paleoseismic rupture should be shown as a continuous fault trace.

Fault 1116, slip-rate category [Kingman Quad.]

The first sentence should be modified to be more accurate. Insert the word "reconnaissance" before the first "vertical slip rate", and restrict the slip-rate estimate in the first sentence to the first, single significant figure, "0.2 mm/yr".

Fault 1117, map

The fault trace can be better represented and this is important because there is development surrounding (and obliterating) the fault. Take fault traces from the NBMG Frenchman Mountain, Las Vegas NE, and Henderson Quadrangles; I'm supplying copies of each. The trace begins near the top of the Frenchman Mountain Quadrangle, and wraps around to the south into the Las Vegas NE Quadrangle, where the antithetic fault making the graben and other fault traces in the piedmont are important to include. The fault trace swings back to the southeast and is relatively straight, clearly dragging the Horse Springs Formation along it in a right-lateral sense. A set of right-lateral arrows would be appropriate in this reach; we think that Quaternary activity

has a lateral component as well, but this hasn't been proven. The fault trace continues onto the Henderson Quadrangle and can be taken at least to Las Vegas Wash.

Fault 1117, slip-rate category

Add following the third sentence in the discussion, "dePolo derived this rate from a level line run across the graben (since destroyed) in the central part of the fault zone, that yielded a vertical offset of about 7.5 m and age estimate of 500 ka based on estimates made by Sowers (1992) for this area."

Sowers, J.M., 1992, Soil Stratigraphic investigations in the Hoover Dam area, in Andreson, L.W. and O'Connell, D.R., Seismotectonic study of the northern portion of the lower Colorado River, Arizona, California, and Nevada: U.S. Bureau of Reclamation Seismotectonic Report 93-4, 11 p.

Fault 1118, sense of movement

This fault likely has a left-lateral strike-slip component to it (indicated as an oblique component by dePolo, 1998) based on the north-northeast orientation, the overall linearity of the central portion of the fault, associated antithetic faults that are consistent with left-lateral (i.e., small secondary grabens are at an angle to the fault rather than parallel), the right-stepping nature of the fault traces or scarps, and possible left-lateral offsets of small alluvial cones from small drainages across the fault in the central part of the zone.

Fault 1118, slip-rate category

This fault likely belongs in the 0.2 to 1 mm/yr. The "known" rate alluded to by dePolo (1998) was based on a minimum 5.5-m (+/- 0.5 m) vertical offset of a terrace with a fairly weak soil profile that is well exposed along the banks of transversing streams. The soil has Stage II to III? carbonate development and minor reddening of the B horizon, but little or no clay movement. I estimated an age of about 20 kyr (10-60 ka) for this offset which was likely made by two and possibly three events based on scarp bevels and comparison of the compound-scarp height with single-event scarp height. This is where dePolo came up with his 0.28 mm/yr vertical rate. This rate would be a minimum because of the additional left-lateral component that exists (see above comment), and the buried lower surface where the profile was made.

Fault 1119, sense of movement

Campagna (1990) shows left-lateral displacement on the northeasterly striking fault traces, including on a fault in pediment gravels of Quaternary age (see his Geologic map of the Bitter Ridge area). Add left-lateral displacement on northeast striking faults to the sense of movement



and reference Campagna. In text, Campagna also comments that “strike-slip faulting cuts the Quaternary fanlomerate”.

Fault 1119, geologic setting

Add at the end of discussion, “Campagna (1990 # ___) notes that a “Recent [Holocene] alluvial fan coming from the mountain front is offset three to four meters by a down-to-the-west normal fault” along the western front of the Virgin Mountains.”

Campagna is not clear enough to know whether this is a measurement from a fault scarp, of an actual exposure of the “Recent alluvial fan” so I put this statement in the geologic setting.

Campagna (1990), The Lake Mead fault system and the Las Vegas Valley shear zone: strike-slip faulting and associated deformation in the basin and range, southeastern Nevada: PhD. Thesis, Purdue University, 79 p.

Fault 1120, map and synopsis

These faults should be portrayed as being < 130 ka or “green” on the maps, with exception of a small portion that I will indicate on the map as being < 15 ka or “orange” due to recent work by dePolo and others (2002). There are faults in < 130 ka age deposits (see the geologic map of the Las Vegas NW Quadrangle, 1:24,000) and the youthful nature of some of the fault scarps support the late Pleistocene activity. The debate as to the origin of these scarps can be represented as a probability of these faults being a seismic source, say for the NEHRP seismic hazard maps, but these faults nevertheless pose surface disruption hazards from potential earth fissure formation, etc.. Thus, I do not think they should be considered “Class B” features.

Fault 1120, map

There are few symbols indicating the downthrown side of the faults on the map. Dip directions for these faults have been indicated on the NBMG geologic maps of the Las Vegas NW and Las Vegas SW Quadrangles (1:24,000). I will annotate a copy for you.

As I examined the map, I noticed several fault traces are missing that were compiled by Bell and Price, and that some minor stylization has occurred (a trace that actually steps has an inferred connection). The differences between the 1:24,000 fault maps and Bell and Price is pretty small, the latter indicating the dashed ends of some of the faults are lineaments, and so forth. I am sending a set of the 1:24,000 scale maps for you to partly use. John Bell may have a digital file of these faults we can give you, I’m not sure. In any case, this is an area that will be scrutinized, and every fault trace we know about should be on the map.



ADDITIONAL FAULTS

The West Charleston fault zone should be indicated on the map and given a data entry. The most detailed mapping of this fault zone is McDonnell-Canan and others (2000) Geologic map of the Blue Diamond NE Quadrangle, NBMG Map 124, 1:24,000. This zone is mapped as lineaments and a couple fault scarps on Dohrenwend and others (1991) and I have seen a fault in Quaternary alluvium on at least one of these traces. Although it may only have had small amounts of mid Pleistocene activity, its proximity to Las Vegas makes it important.

The River Mountains fault would also be an important one to include. This is the "dotted fault" on the Henderson Quadrangle That goes from the northern part of section 10 to the northern part of section 23, T22S, R63E. The fault actually hooks south at the drainage of Interior Valley, offsetting a small portion of the Quaternary piedmont. I could potentially write this up for you this summer. Burt Slemmons has apparently found some fault scarps? in Interior Valley, but you would have to talk to him about these.

In the Kingman Quadrangle, there are three faults that may control Quaternary deposition and have proximal closed depressions that could be caused by Quaternary tectonism. These faults should be on the map as at least Type B faults. These faults bound the western McCullough Range, and the eastern side of the closed basins of Jean lake and Hidden Valley. Urbanization is progressing out to these areas.

