Reply to reviewer n.1: unknown

"Evaluating performances of simplified physically based models for landslide susceptibility"

G. Formetta, G. Capparelli, P. Versace.

We thank the reviewer n. 1 for the revision and the suggestions. We replied in bold below each comment.

Q1)…tool…

A1) We revised the sentence according the reviewer's suggestion:

Old sentence: "but also a fundamental tools for the environment"

New sentence: "but also a fundamental tool for the environment"

Q2) Is it 1999 or 2006?

A2) We agree with the reviewer suggestion. The reference Guzzetti et al., 1999 was missing and we added the reference in the revised paper:

"Guzzetti, Fausto, Alberto Carrara, Mauro Cardinali, and Paola Reichenbach. "Landslide hazard evaluation: a review of current techniques and their application in a multi-scale study, Central Italy." *Geomorphology* 31, no. 1 (1999): 181-216."

Q3) instead "most" use "best"?

A3) We revised the sentence according the reviewer's suggestion:

Old sentence: "the choice of the more accurate model"

New sentence: "the choice of the best accurate model"

Q4) reasons

A4) We revised the sentence according the reviewer's suggestion:

Old sentence: "For these reason"

New sentence: "For these reasons"

Q5) Brenning is not listed in the References.

33 **A5)** We agree with the reviewer suggestion. The reference Brenning, 2005 was
34 missing and we added the reference in the revised paper:
35 Brenning, A. "Spatial prediction models for landslide hazards: review, comparison
36 and evaluation." *Natural Hazards and Earth System Science* 5, no. 6 (2005): 853-
37 862.
38
39 **Q6)** OMS is a...
40 **A6)** We revised the sentence according the reviewer suggestion:
41 Old sentence: "OMS a Java based modeling framework that promotes"
42 New sentence: "OMS is a Java based modeling framework that promotes"
43
44 **Q7)** Worku is missing in the References
45 **A7)** We agree with the review comment. We had a cited Worku in a wrong way, the
46 correct work is Abera et al 2015 and Abera is currently in the references.
47
48 **Q8)** Rosso et al., 2006
49 **A8)** We agree with the review suggestion and we revised twice accordingly:
50 Old sentence: "Rosso et al 2008"
51 New sentence: "Rosso et al 2006"
52
53 **Q9)** .. slope gradient ...
54 **A9)** We agree with the review suggestion and we revised accordingly:
55 Old sentence: "slope gradient"
56 New sentence: "slope gradient, "
57 **Q10)** .. slope gradient ...
58 **A10)** We agree with the review suggestion and we revised accordingly:
59 Old sentence: "angle"
60 New sentence: "angle, "
61
62 **Q11)** .. slope gradient ...
63 **A11)** We agree with the review suggestion and we revised accordingly:
64 Old sentence: "soil"
65 New sentence: "soil, "

66

Q12) Add Worku et al., 2014 to reference list.

A12) We solved the problem of the reference Abera et al 2.016 as specified in answer A7.

Q13) Results are presented...

A13) We agree with the reviewer's suggestion and we revised the sentence:

Old sentence: Results were presented in Table

New sentence: Results are presented in Table

Q14) Provide not provides

A14) We agree with the reviewer's suggestion and we revised the sentence:

Old sentence: For the model M2 and M3 it is clear that ACC, HSS, and CSI provides the less performing models results

New sentence: For the model M2 and M3 it is clear that ACC, HSS, and CSI provide the less performing models results

Q15) ...are similar to each other...

A15) We agree with the reviewer's suggestion and we revised the sentence:

Old sentence: ...are similar to each others...

New sentence: ...are similar to each other...

Q16) …the third step shows

A16) We agree with the reviewer's suggestion and we revised the sentence:

Old sentence: ... the third step show

New sentence: ... the third step shows

Q17) … fact accommodate

A17) We agree with the reviewer's suggestion and we revised the sentence:

Old sentence: A more sensitive couple model-optimal parameter set will in fact accommodates

New sentence: A more sensitive couple model-optimal parameter set will in fact accommodate

99

100   **Q18)** … according to FS

101   **A18)** We agree with the reviewer's suggestion and we revised the sentence:

102   Old sentence: are assigned from low to high according FS

103   New sentence: are assigned from low to high according to FS

104

105   **Q19)** … ...this allows the...

106   **A19)** We agree with the reviewer's suggestion and we revised the sentence:

107   Old sentence: and this allow the user to

108   New sentence: and this allows the user to

109

110   **Q20)** … ...this allows the...

111   **A20)** We agree with the reviewer's suggestion and we revised the sentence:

112   Old sentence: is the number of correct detected lindslided pixels

113   New sentence: is the number of correct detected lindslide pixels

114

115

116   **Q21)** … ...measures...

117   **A21)** We agree with the reviewer's suggestion and we revised the sentence:

118   Old sentence: It measure the distance

119   New sentence: It measures the distance

120

121   **Q22)** performance with respect

122   **A22)** We agree with the reviewer's suggestion and we revised the sentence:

123   Old sentence: to quantify the model performance respect to set of control or
124   reference model

125   New sentence: to quantify the model performance with respect to set of control or
126   reference model

127

128   **Q23)** delete "that indicates"

129   **A23)** We agree with the reviewer's suggestion and we revised the sentence:

130   Old sentence: Negative values indicate that indicates that the mod

131   New sentence: Negative values indicate that the mod

132

133   **Q24)** treats

134   **A24)** We agree with the reviewer's suggestion and we revised the sentence:

135   Old sentence: A problem of TSS is that it threats the hit rate

136   New sentence: A problem of TSS is that it treats the hit rate

137

138   **Q25)** This reference is not mentioned in the text.

139   **A25)** We removed the reference: Baum, R., Savage, W., and Godt, J, (2002)

140   TRIGRS A fortran program for transient rainfall infiltration and grid-based regional

141   slope-stability analysis, US Geological Survey Open Report, Golden (CO), 424, 61

142

143   **Q26)** This reference is not mentioned in the text.

144   **A26)** We removed the reference: Brown, C. D., & Davis, H. T. (2006). Receiver

145   operating characteristics curves and related decision measures: A tutorial.

146   Chemometrics and Intelligent Laboratory Systems, 80(1), 24-38.

147

148   **Q27)** This reference is not mentioned in the text.

149   **A27)** We did not remove the reference Fabbricatore et al., 2014 because is in the

150   sentence:

151   "The Crati Basin is a Pleistocene-Holocene extensional basin filled by clastic marine

152   and fluvial deposits (Vezzani, 1968, Colella et al., 1987, Fabbricatore et al., 2014)."

153

154   **Q28)** This reference is not mentioned in the text.

155   **A28)** We do not deleted the reference Formetta et al., 2015 because is in the text but

156   was indicated as Formetta et al. 2014. So we fixed the error:

157   Old sentence: The landslide susceptibility models implemented in NewAge-JGrass

158   and presented in a preliminary application in Formetta et al., 2014

159   New sentence: The landslide susceptibility models implemented in NewAge-JGrass

160   and presented in a preliminary application in Formetta et al., 2015

161

162   **Q29)** This reference is not mentioned in the text.

163   **A29)** We removed the reference:

164   Hutchinson, J. N. (1995): Keynote paper: Landslide hazard assessment. In: Bell,

165   D.H. (ed.), Landslides, Balkema, Rotterdam, 1805–1841.

166

167   **Q30)** This reference is not mentioned in the text.

168   **A30)** We did not remove the reference Jolliffe and Stephenson, (2012) because is in

169   the sentence:

170   "Accurate discussions about the most common quantitative measures of goodness

171   of fit (GOF) between measured and modeled data are available in Bennet et al.,

172   (2013), Jolliffe and Stephenson, (2012), Beguería (2006), Brenning (2005) and

173   references therein"

174

175   **Q31)** This reference is not mentioned in the text.

176   **A31)** We removed the reference:

177   Lee, S., Chwae, U. and Min, K. (2002) Landslide susceptibility mapping by

178   correlation between topography and geological structure: the Janghung area, Korea.

179   Geomorphology, 46:3-4 149-162

180

181   **Q32)** This reference is not mentioned in the text.

182   **A32)** We removed the reference:

183   Petschko, H., Brenning, A., Bell, R., Goetz, J., and Glade, T.: Assessing the quality

184   of landslide susceptibility maps – case study Lower Austria, Nat. Hazards Earth Syst.

185   Sci., 14, 95-118, doi:10.5194/nhess-14-95-2014, 2014.

186

187   **Q33)** This reference is not mentioned in the text.

188   **A33)** We removed the reference:

189   Varnes D.J. (1984), and IAEG Commission on Landslides and other Mass

190   Movements, Landslide hazard zonation: a review of principles and practice.

191   UNESCO Press, Paris, 63 p.

192

193   **Q34)** This reference is not mentioned in the text.

194   **A34)** We removed the reference:

195   Wu, W., and R. C. Sidle (1995), A Distributed Slope Stability Model for Steep

196   Forested Basins, Water Resour. Res., 31(8), 2097–2110, doi:10.1029/95WR01136.

197

198   **Q35)** Results are presented...

199   **A35)** We agree with the reviewer's suggestion and we revised the sentence:

200   Old sentence: Results were presented for each model

201   New sentence: Results are presented for each model

202

203   **Q36)** calibration (CAL) and verification (VAL).

204   **A36)** We agree with the reviewer's suggestion and we revised the sentence:

205   Old sentence: calibration and verification.

206   New sentence: calibration (CAL) and verification (VAL).

207

208   **Q37)** are shown

209   **A37)** We agree with the reviewer's suggestion and we revised the sentence:

210   Old sentence: In bold the rows for which

211   New sentence: In bold are shown the rows for which

212

213   **Q38)** GIS is written twice and Geographic is missing a letter "a".

214   **A38)** We removed one of the GIS and we fixed the typo:

215   Old sentence: Geogrphic informatic system

216   New sentence: Geographic informatic system

217

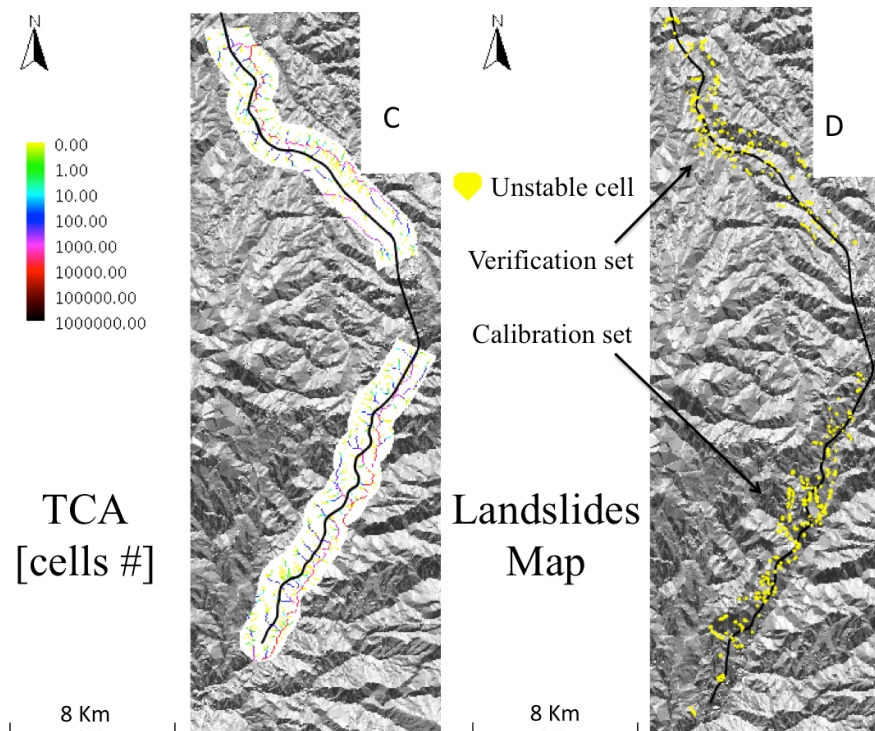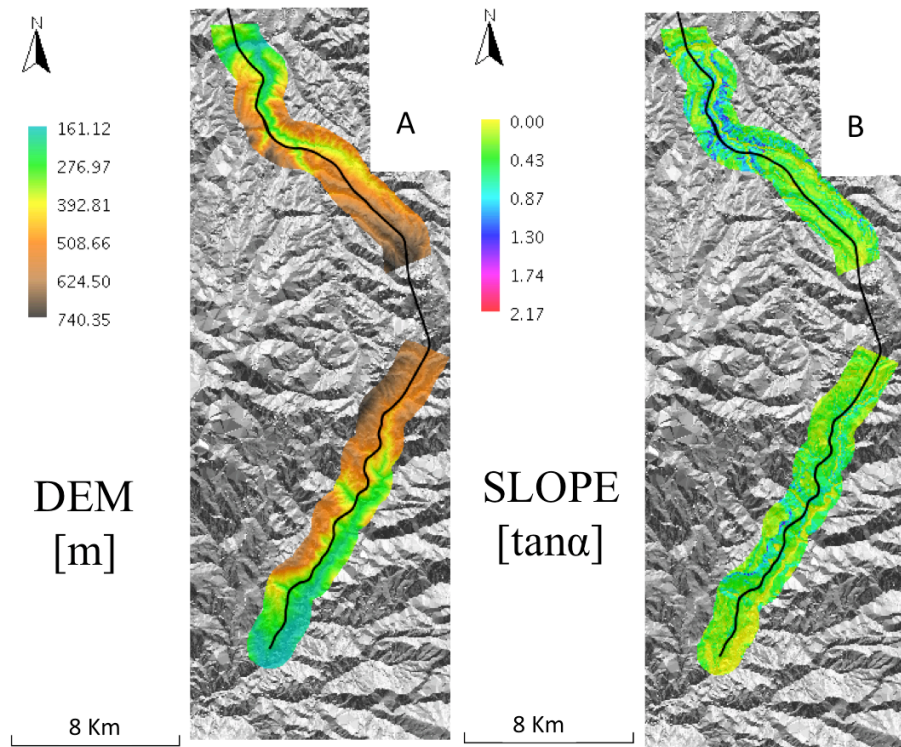218   **Q39)** The text is small and consequentially hard to read.

219   **A39)** We revised the font of the figure according the reviewer's suggestion

220   Old version:

New version:

DEM
[m]

8 Km

SLOPE
[tanα]

8 Km

TCA
[cells #]

8 Km

Landslides
Map

8 Km
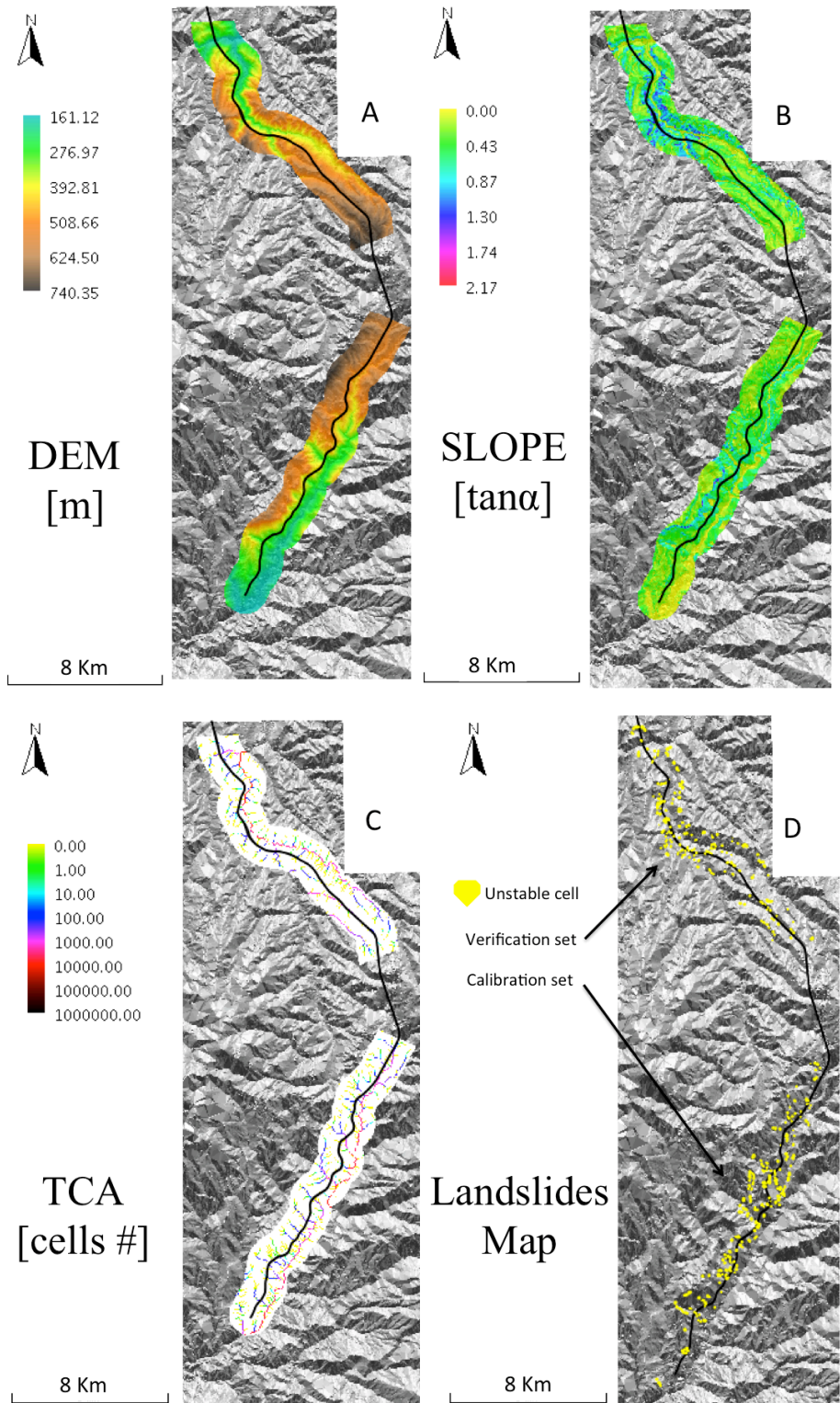
Q40) Could you scale up the section where the scores are shown to emphasise the differences?

A40) We thank the author for the suggestion but we prefer to maintain the complete dimension of the ROC space, this will help the reader to easily understand the differences between the three models. Moreover a full representation of all the models is reported in appendix.
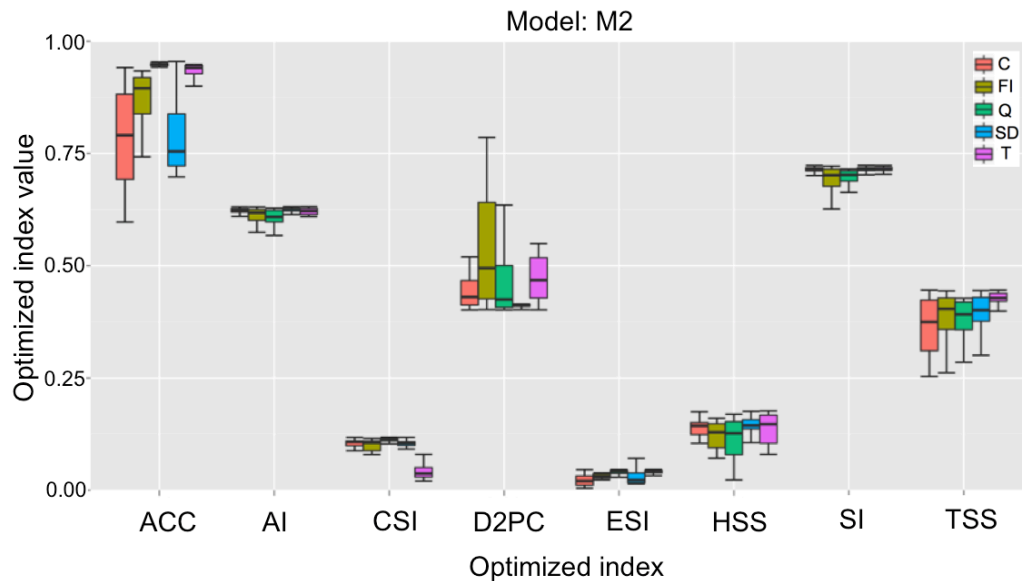
Q41) The text is small and consequentially hard to read.

A41) We revised the font of the figure according the reviewer's suggestion
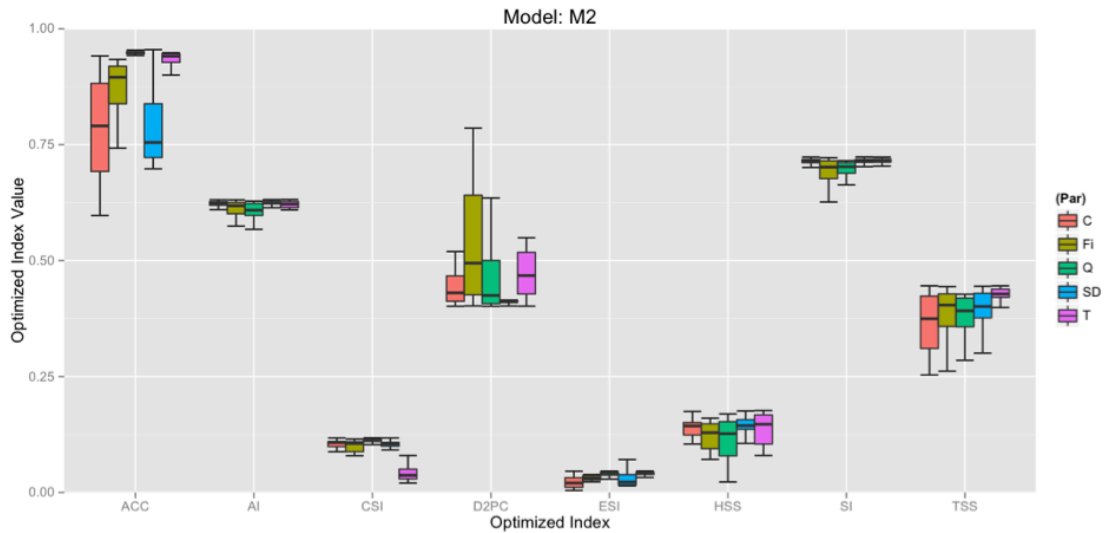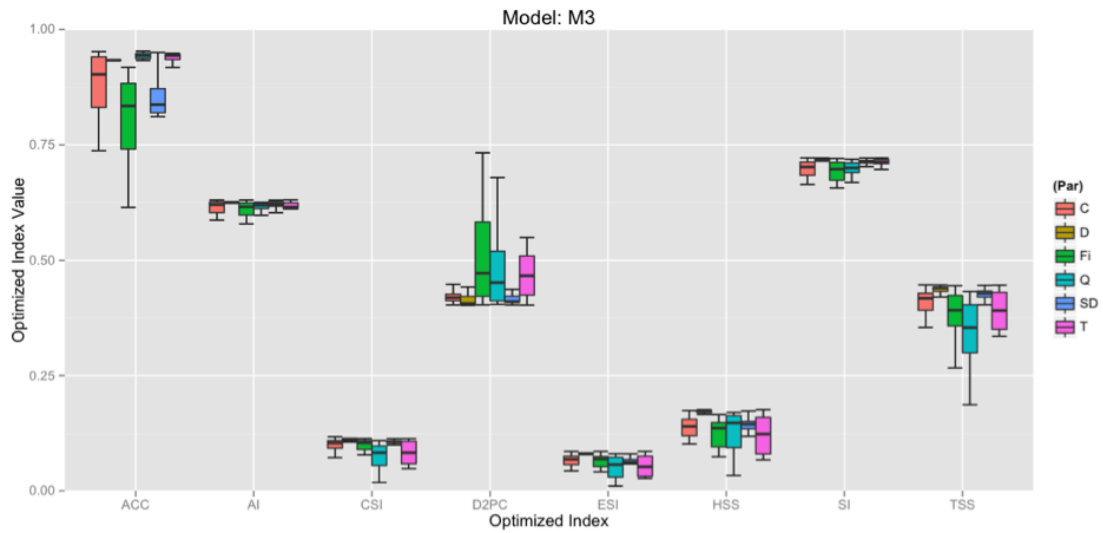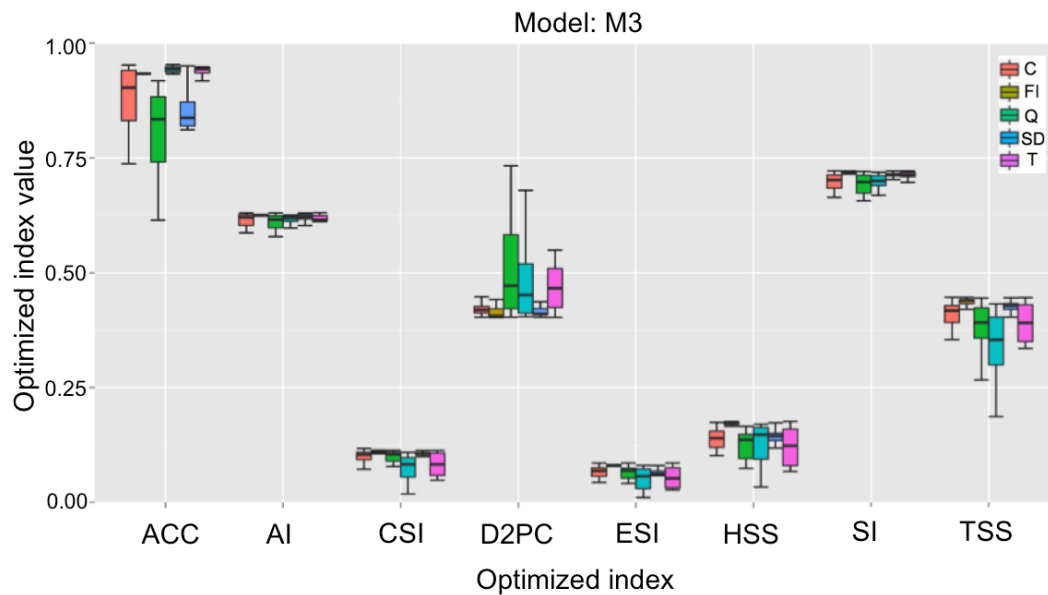
Old version:

New version:

Q42) The text is small and consequentially hard to read.

A42) We revised the font of the figure according the reviewer's suggestion
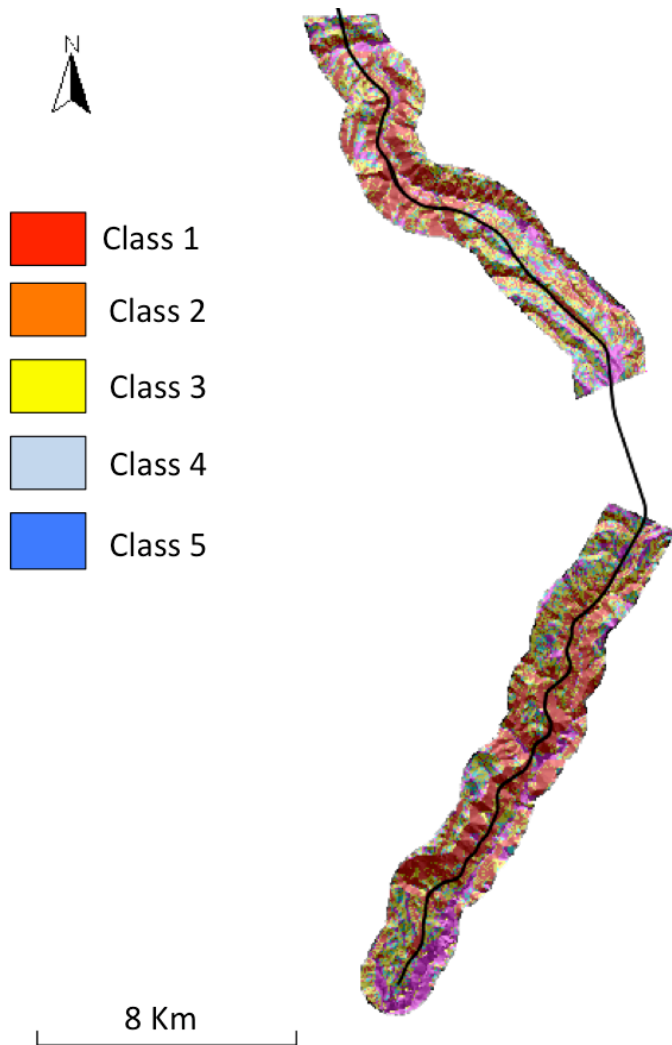
Old version:

New version:

Q43) What is the meaning of classes 1-5? I suggest you put the values of FS with the class tags (Class 1 (FS< 1.0), Class 2 (1.0 <FS< 1.2), Class 3 (1.2 <FS< 1.5), Class 4 (1.5 <FS< 2.0), Class 5 (FS> 2)

A43) We agree with the reviewer's suggestion and we modified the figure accordingly:

Old version:

N

Class 1
Class 2
Class 3
Class 4
Class 5

8 Km

New version:

Class 1 (FS<1.0)

Class 2 (1.0<FS<1.2)

Class 3 (1.2<FS<1.5)

Class 4 (1.5<FS<2.0)

Class 5 (FS>2.0)

N

8 Km